

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**



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In The Matter of the Application of San Diego Gas & Electric Company (U902G) and Southern California Gas Company (U904G) for a Certificate of Public Convenience and Necessity for the Pipeline Safety & Reliability Project.

A.15-09-013

**PROTECT OUR COMMUNITIES FOUNDATION, SIERRA CLUB,
SOUTHERN CALIFORNIA GENERATION COALITION,
AND THE UTILITY REFORM NETWORK
PETITION FOR MODIFICATION OF DECISION 18-06-028**

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A.15-09-013

**PROTECT OUR COMMUNITIES FOUNDATION, SIERRA CLUB,
SOUTHERN CALIFORNIA GENERATION COALITION,
AND THE UTILITY REFORM NETWORK
PETITION FOR MODIFICATION OF DECISION 18-06-028**

In accordance with Rule 16.4 of the Rules of Practice and Procedure of the California Public Utilities Commission (“Commission”), Protect Our Communities Foundation (“POC”), Sierra Club, Southern California Generation Coalition (“SCGC”), and The Utility Reform Network (“TURN”) (jointly, “Petitioners”) petition for modification of Decision (“D.”) 18-06-028 dated June 21, 2018.¹ Consistent with Rule 16.4(d) of the Commission’s Rules and Practice and Procedure, this Petition for Modification is being filed and served within one year of the effective date of D.18-06-028.

The Petitioners request that D.18-06-028 be modified (1) to conform Ordering Paragraph 7 to provisions in the text of D.18-06-028 about what the Applicants must include in the hydrostatic test or replacement plan that is required by Ordering Paragraph 7, (2) to expand Conclusion of Law 19 and Ordering Paragraph 7 to require the Applicants to submit the hydrostatic test or replacement plan in this proceeding with supporting documentation including direct testimony so that there can be a thorough review by the Commission and the public in a

¹ D.18-06-028, p. 131 (June 21, 2018).

transparent process, (3) to revise Finding of Fact 72 to accommodate the submission of the hydrostatic test and replacement plan that would be required by the modified Ordering Paragraph 7, and (4) to revise Ordering Paragraph 19 to keep Application 15-09-013 open for consideration of the hydrostatic test and replacement plan.

I. INTRODUCTION.

This proceeding began on September 30, 2015, when the Southern California Gas Company (“SoCalGas”) and San Diego Gas & Electric Company (“SDG&E”) (jointly, “Applicants”) filed Application (“A.”) 15-09-013. The Applicants requested a Certificate of Public Convenience and Necessity (“CPCN”) to construct approximately 47 miles of a new 36-inch diameter transmission pipeline, Line 3602, in San Diego County. The Applicants projected a loaded and escalated cost of \$528.5 million for Line 3602.² The Applicants said that construction of the new transmission line would enable them to derate the existing SDG&E 16-inch diameter Line 1600 from transmission service to distribution service. The fully loaded and escalated cost of derating Line 1600 was projected to be \$29.5 million,³ so the combined construction and derating projects would cost a total of \$558 million.

For comparison, the Applicants said that if they pressure tested Line 1600 to meet the “pressure test or replace” requirements of Section 958 of the California Public Utilities Code instead of constructing Line 3602 and derating Line 1600, the direct cost of pressure testing would be \$112.9 million.⁴ Although the pressure testing cost was not loaded and escalated, it looked like pressure testing Line 1600 would cost much less than the combined cost of constructing Line 3602 and derating Line 1600 to distribution service.

² A.15-09-013, p. 6; Exhibit (“Ex.”) SDGE-9, p. 5.

³ Ex. SDGE-9, p. 4 (Table 3B).

⁴ Ex. SDGE-8-R, p. 24 (Table 8).

Subsequently, in D.18-06-028, the Commission denied the Applicants' request for a CPCN for the proposed Line 3602, finding that "the best short-term course is to keep line [1600] at current 512 psig or MAOP, and direct the development of a hydrostatic pressure test plan consistent with Pub. Util. Code § 958, especially if recordkeeping practices are found deficient."⁵ The Commission ordered that no later than three months from the date that D.18-06-028 was issued, June 26, 2018, the Applicants "shall submit to Safety and Enforcement Division a hydrostatic test or replacement plan pertaining to the existing 49.7 miles of Line 1600 in its present corridor,"⁶ clearly having the impression that a hydrostatic test of the existing Line 1600 would be much less expensive than the combined cost of constructing Line 3602 and derating of Line 1600. That was certainly the expectation of the Petitioners.

Subsequently, the Petitioners and the public learned from a February 24, 2019 San Diego Union-Tribune newspaper article that the Applicants submitted the required hydrostatic test or replacement plan on September 26, 2018, proposing to replace most of Line 1600. The San Diego Union-Tribune article is attached as Attachment 1. The Petitioners also learned from the article that on January 15, 2018, the Commission's Safety and Enforcement Division ("SED") sent a letter to SoCalGas saying that "SED approves" the Applicants' September 26, 2018 hydrostatic test and replacement plan.⁷ The SED letter is attached as Attachment 2. Neither the plan that the Applicants submitted to the SED nor the SED's January 15, 2018 letter was served on the A.15-09-013 service list.

⁵ D.18-06-028, p. 81.

⁶ *Ibid*, p. 128 (Ordering Paragraph 7).

⁷ Safety and Enforcement Division's (SED) Response to San Diego Gas and Electric Company's (SDG&E) and Southern California Gas Company's (SoCalGas) Submission of Line 1600 Hydrostatic Test or Replacement Plan in Fulfilment of Pipeline Safety Enhancement Plan (PSEP) for Review and Approval (January 15, 2019).

The San Diego Union-Tribune article said that the Applicants' plan was projected to cost \$677 million, nearly thirty percent more than the cost of the all-new 36-inch Line 3602 that the Applicants had proposed to replace most of the transmission function of Line 1600.⁸

On March 4, 2018, POC submitted a Public Records Act request for the Applicants' September 26, 2018 hydrostatic test or replacement plan. POC received the Applicants' Line 1600 Test or Replacement Plan ("Plan") from the Commission on March 4, 2018. The Plan is attached as Attachment 3.⁹ The Line 1600 Test or Replacement Plan confirms that the loaded and escalated cost would be the \$677 million reported by the San Diego Union-Tribune.¹⁰ The cost of a "Full Hydrotest" of Line 1600 including a "retrofit" of Line 1600 to make the line "fully piggable" would be \$325 million.¹¹ The Applicants touted a "Full Replacement along Highway 395" as offering the "greatest safety enhancement benefits for a modest 7% increase in cost,"¹² but they recommended instead the \$677 million project.¹³

In addition to asking ratepayers to bear almost thirty percent more than the cost of the new 36-inch Line 3602, the Applicants' Line 1600 Test or Replacement Plan would raise the Maximum Allowable Operating Pressure ("MAOP") of Line 1600 from 512 pounds per square inch gage ("psig") to 800 psig, resulting in the Applicants' transmission Lines 1600 and 3010 having a combined capacity significantly greater than the current 595 million cubic feet per day ("MMcf/d" or "MMcfd"), even though the Commission explicitly required that the Applicants

⁸ Attachment 1.

⁹ The Plan that is attached as Attachment 3 is the version that can be accessed by clicking on the link, "estimated will cost \$677 million," in the electronic version of the San Diego Union-Tribune article that is attached as Attachment 1. The version of the plan that was provided by the Commission in response to POC's PRA request and the version posted on the San Diego Union-Tribune contain identical redactions, but the version that was provided by the Commission has at the top of each page in red and italics, "Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023."

¹⁰ Attachment 3, p. 2.

¹¹ *Ibid.*

¹² Attachment 3, p. 84.

not provide for capacity above the current 595 MMcf/d combined capacity of transmission Lines 3010 and 1600 operating together.¹⁴

Equally shocking, the Applicants have completely avoided even a nod to the Commission’s requirement that the hydrostatic test or replacement should be for the “short-term.”¹⁵ For the “long-term” the Applicants were to derate the MAOP of Line 1600 from 512 psig to 320 psig. In Conclusion of Law 11 in D.18-06-028, the Commission said: “It is reasonable to maintain Line 1600 in transmission service at 512 psig in the short-term subject to the PSEP Decision Tree and Pub. Util. Code § 958; however, once short-term issues are resolved, its MAOP should be further reduced as soon as practicable while maintaining reliability.”¹⁶

The Commission explained that if Line 1600 were derated to below 20 percent of Specified Minimum Yield Strength (“SMYS”), the line would not “fail in a rupture mode and

¹³ Attachment 3, p. 3.

¹⁴ D.18-06-028, p. 127 (Ordering Paragraph 1). Under 49 CFR § 192.619(a), the MAOP of a pipeline is established at the lowest of four values. However, for Line 1600 the Applicants appear to assume the value is prescribed by 49 CFR § 192.619(a)(2). That section provides that the MAOP shall be the “pressure obtained by dividing the pressure to which the segment was tested after construction as follows:...(ii) For steel pipe operated at 100 p.s.i. (689 kPa) gage or more, the test pressure is divided by a factor in accordance with the following table:

Class location	Factors ¹ , segment -		
	Installed before (Nov. 12, 1970)	Installed after (Nov. 11, 1970)	Converted under § 192.14
1	1.1	1.1	1.25
2	1.25	1.25	1.25
3	1.4	1.5	1.5
4	1.4	1.5	1.5

(footnote omitted).

For purposes of this Petition, the Petitioners also assume the applicable test is prescribed by 49 CFR § 192.619(a)(2). Thus, if a segment of Line 1600 were in a Class 3 or 4 location and were tested to 1200 psig, the MAOP of testing under 18 CFR § (619(a)(2) would be 800 psig, although the governing MAOP of Line 1600 would be lower than 800 psig if any of the other three required values under 49 CFR §192.619(a) were lower than 800 psig.

¹⁵ D.18-06-028, pp. 74-82.

¹⁶ *Ibid*, p. 124 (Conclusion of Law 11).

can only fail in a leak mode.”¹⁷ The Commission said further: “If the line’s MAOP is 320 psig, we agree with experts that the line could operate indefinitely with the required maintenance.”¹⁸

The Line 1600 Test or Replacement Plan that the Applicants submitted to SED would completely frustrate the Commission’s aspiration to derate Line 1600 so it could not rupture and could operate indefinitely as a distribution line. Instead of complying with D.18-06-028, the Applicants propose a high-priced replacement of 37 miles of Line 1600 with 43 miles of new pipe, which would make it nonsensical to derate Line 1600 in the foreseeable future.

Until seeing the Applicants’ Line 1600 Test or Replacement Plan, the Petitioners had every reason to believe that the Applicants would submit a plan to SED that would comply with the provisions and intent of D.18-06-028. However, the Applicants decided to go in exactly the opposite direction, proposing to expand the capacity of the SDG&E transmission system while obviating any possibility of improving the safety and extending the life of Line 1600 by derating the line to an MAOP of 320 psig, all at a loaded and escalated cost of \$677 million that is higher than any of the alternatives proposed in A.15-09-013.

For these reasons as further discussed below, the Petitioners request that D.18-06-028 be modified (1) to conform Ordering Paragraph 7 to provisions in the text of D.18-06-028 about what the Applicants must include in the hydrostatic test or replacement plan that is required in Ordering Paragraph 7, (2) to expand Conclusion of Law 19 and Ordering Paragraph 7 to require the Applicants to submit the hydrostatic test or replacement plan in this proceeding with supporting documentation including direct testimony and cost forecasts so that there can be a thorough review by the Commission and the public in a transparent process, (3) to revise Finding of Fact 72 to accommodate the submission of the hydrostatic test and replacement plan that is

¹⁷ *Ibid*, p. 79.

¹⁸ *Ibid*, p. 85.

required by Ordering Paragraph 7 in this proceeding, and (4) to revise Ordering Paragraph 19 to keep Application 15-09-013 open for consideration of the new test or replacement plan.

II. BACKGROUND.

This section presents an overview of A.15-09-013, a review of the results reached by the Commission in D.18-06-028, and an analysis of the Applicants' Line 1600 Test or Replacement Plan.

A. Summary of A.15-09-013.

In their September 30, 2015 Application 15-09-013, the Applicants requested a CPCN to construct approximately 47 miles of 36-inch diameter transmission pipeline, Line 3602, in San Diego County at a loaded and escalated cost of \$528.5 million.¹⁹ The Applicants said that construction of the new Line 3602 would enable them to derate the existing SDG&E 16-inch diameter Line 1600 from transmission service to distribution service, removing Line 1600 from the scope of the Applicants' Pipeline Safety Enhancement Plan ("PSEP").²⁰

Line 1600 is a 16-inch diameter pipeline that was constructed in 1949 to transport gas south from the SoCalGas/SDG&E interconnection at the Rainbow Metering Station.²¹ Line 1600 has not been pressure tested. In D.11-06-017, in response to the catastrophic rupture of a Pacific Gas & Electric Company ("PG&E") transmission pipeline in San Bruno, California, on September 9, 2010, the Commission ordered each major California gas utility to submit a "Natural Gas Transmission Pipeline Comprehensive Testing Implementation" to pressure test or replace pipelines for which the utilities lack records of a pressure test.²² In compliance with

¹⁹ A.15-09-013, p. 6; Ex. SDGE-9, p. 5.

²⁰ A.15-09-013, p. 4.

²¹ Ex. SDGE-12, p. 13; Transcript ("Tr.") 103-104 (Applicants/ Schneider).

²² D.11-06-017, pp. 1, 31 (Ordering Paragraph 4) (June 9, 2011).

D.11-06-017, the Applicants filed their PSEP on August 26, 2011, as amended on December 2, 2011, with the PSEP subsequently being reassigned for consideration in A.11-11-002.²³

Throughout the proceeding in A.11-11-002, the Applicants maintained that Line 1600 would have to be replaced because it could not be taken out of service with manageable customer impacts.²⁴ In the course of the proceeding in A.11-11-002, the Applicants removed their proposal to replace the Line 1600 from the scope of A.11-11-002 and deferred the replacement project to a future application.²⁵ The Decision Tree approved in D.14-06-007 included Line 1600 in what the Applicants call “Phase 1B” with the following instruction: “Install new line and pressure test existing line.”²⁶ The Commission instructed that the Applicants’ proposal should be addressed in a new application, which became A.15-09-013.²⁷

Sometime after the Commission issued D.14-06-007, the Applicants decided that, contrary to their assumptions throughout the proceeding in A.11-11-002, Line 1600 could be pressure tested with “manageable customer impacts.”²⁸ Neither the public nor, as far as the Petitioners know, the Commission was informed that Line 1600 could be pressure tested with manageable customer impacts until the Applicants filed their reply to protests in A.15-09-013 on November 12, 2015.

The Applicants estimated that the direct cost of pressure testing Line 1600 would be \$112.9 million.²⁹ By comparison, the direct cost of derating Line 1600 from Rainbow Station to

²³ D.12-04-021, p. 12 (Ordering Paragraph 1) (April 19, 2012).

²⁴ Tr. 1/101 (Applicants/ Schneider)

²⁵ D.14-06-007, pp. 16-17.

²⁶ *Ibid*, p. 17.

²⁷ D.14-06-007, pp. 16-17.

²⁸ Tr. 1/110-111 (Applicants/ Schneider).

²⁹ Ex. SDGE-8-R, p. 24 (Table 8).

Kearny Villa Station was estimated to be \$12.8 million, although the fully loaded and escalated cost would be \$29.5 million.³⁰

In addition to Line 1600, SDG&E's 30-inch Line 3010 extends south from the Rainbow Metering Station interconnection with SoCalGas. The MAOP of Line 1600 is 512 psig.³¹ If operated together, Line 1600 with an MAOP of 512 psig has a capacity of 65 MMcf/d, and Line 3010 has a capacity of 530 MMcf/d, resulting in a combined capacity of 595 MMcf/d to transport gas south from the Rainbow Metering Station.³²

The capacity of 595 MMcf/d of Lines 1600 and 3010 operating together is more than sufficient to meet the highest SDG&E long-term peak gas demand (1-in-10 year cold day) forecast for the 2016-2036 twenty-year period considered in A.15-09-013. SDG&E demand reaches a peak of 590 MMcf/d in operating year 2020-2021 and declines thereafter.³³

If Line 1600 were removed from service, the total system capacity would be 570 MMcf/d from Line 3010 alone, which is sufficient to meet the SDG&E long-term peak demand forecast for all years after operating year 2022-2023 as considered in A.15-09-013.³⁴

B. Summary of D.18-06-028.

In D.18-06-028, the Commission denied Applicants' request for a CPCN for the new 36-inch Line 3602.³⁵ Also, the Commission denied the Applicants' request to reclassify Line 1600 from transportation service to distribution service by derating the MAOP of the line from 512

³⁰ *Ibid*, p. 5 (Table 4B). A major portion of the estimated cost of derating Line 1600 was due to the need to install a new 8-inch diameter distribution line to replace the 36-inch distribution Line 49-31C, a "pre-lay segment" that the Applicants proposed to incorporate into their new Line 3602. Thus, if the Line 3602 proposal were ultimately rejected as it ultimately was in D.18-06-028, the direct cost for derating Line 1600 was likely to be significantly lower to the \$12.8 million projected in A.15-09-013, absent a major increase in the cost of pipeline work since A.15-09-013 was filed. Ex.SDGE-8-R, p. 16.

³¹ D.18-06-028.

³² D.18-06-028, p. 19.

³³ D.18-06-028, p. 20.

³⁴ *Ibid*, pp. 19-20.

psig to 320 psig.³⁶ However, the denial of derating was “without prejudice,” so derating could still occur for the long term.³⁷ Additionally, the Commission required that the Applicants continue to adhere to the Commission’s reliability standards established in D.02-11-003 and D.06-09-039, rejecting the Applicants’ proposal to redefine the Commission’s reliability criteria to permit the construction of redundant transmission capacity.³⁸

The Commission required that the Applicants take three specific actions by September 26, 2018, three months of the issuance of D.18-06-028. One of the actions was that the Applicants were required to submit to the Commission’s Safety and Enforcement Division (“SED”) “a hydrostatic test or replacement plan pertaining to the existing 49.7 miles of Line 1600 in its present corridor.”³⁹ As discussed bellow, the Commission placed two important conditions on “any proposal” that the Applicants would submit.

1. The Commission Prohibited the Applicants from Filing Any Proposal that Would Result in Replacing Line 1600 With a Pipeline Greater than 16-Inches in Diameter or Which Would Increase the Combined Capacity of SDG&E Lines 1600 and 3010 Above 595 MMcf/d.

The first condition that the Commission placed on “any proposal” by the Applicants was that the Applicants were prohibited from proposing to replace Line 1600 with a pipeline that would have a diameter greater than 16 inches or which would increase the capacity of the SDG&E transmission system south of the Rainbow Metering Station to more than 595 MMcf/d, absent “specific and detailed justification for any such increase.”⁴⁰

³⁵ *Ibid*, p. 2, p. 127 (Ordering Paragraph 1).

³⁶ *Ibid*, p. 2, p. 128 (Ordering Paragraph 3).

³⁷ *Ibid*, p. 128 (Ordering Paragraph 3).

³⁸ *Ibid*, pp. 2, 30-33, 124 (Conclusion of Law 6).

³⁹ *Ibid*, p. 128 (Ordering Paragraph 7).

⁴⁰ *Ibid*, p. 2, p. 127 (Ordering Paragraph 1).

In Finding of Fact 10 the Commission found that the existing capacity of Lines 3010 and 1600 with Line 1600 operating at an MAOP of 512 psig was sufficient to meet the peak demand forecast for SDG&E. The Commission stated: “Existing Lines 3010 (530 MMcfd) and 1600 (65 MMcfd at 512 psig), with combined capacity of 595 MMcfd, have sufficient pipeline capacity to meet the Utilities’ own peak forecasts.”⁴¹

Having reached that Finding of Fact, the Commission found in Conclusion of Law 4: “Applicants’ request for a CPCN to construct the proposed Line 3602 Project, or any proposal that involves installing a pipeline to replace Line 1600 that is greater than 16 inches in diameter or increases demand-forecast capacity above the current capacity of 595 MMcfd (FOF 10), without specific and detailed justification, should be denied.”⁴²

Consistent with Finding of Fact 10 and Conclusion of Law 4, Ordering Paragraph 1 of D.18-06-028 states:

San Diego Gas & Electric Company and Southern California Gas Company’s request for a certificate of public convenience and necessity to construct the proposed Line 3602 Project, or any proposal that is greater than 16 inches in diameter or involves installing a pipeline to replace Line 1600 that increases demand-forecast capacity above the current capacity of 595 million cubic feet per day (Finding of Fact 10), without specific and detailed justification, is denied.⁴³

The consequence of Finding of Fact 4, Conclusion of Law 10, and Ordering Paragraph 1, is that the Commission firmly established that with Line 3010 in operation, the MAOP of the 16-inch Line 1600 should not go above 512 psig because that would increase the combined capacity of Lines 3010 and 1600 above 595 MMcf/d.

⁴¹ D.18-06-028, p. 116 (Finding of Fact 10).

⁴² *Ibid*, p. 123 (Conclusion of Law 4) (footnote omitted).

⁴³ *Ibid*, p. 127 (Ordering Paragraph 1).

As a result of determining that the capacity of the SDG&E system could go down from 595 MMcf/d but not up, the Commission authorized SED to reduce the operating pressure of Line 1600. Conclusion of Law 13 stated: “SED is authorized to reduce the operating pressure of Line 1600 to 320 psig, or other “safe” MAOP, to address known safety anomalies over time.”⁴⁴ No authorization was granted to increase the capacity of Line 1600.

2. The Commission Required that the MAOP of Line 1600 Should Remain at 512 PSIG for the Short Term but that Line 1600 Should Be Derated to an MAOP at 320 PSIG in the Long Term.

In addition to capping the MAOP of Line 1600 at 512 psig with Line 3010 in service, the Commission required that Line 1600 should remain in service as a transmission line with an MAOP of 512 psig in the short term, but Line 1600 should be derated to a MAOP of 320 psig for the long term.⁴⁵

a. The Commission Required that the MAOP of Line 1600 Should Remain at 512 PSIG for the Short Term

The Commission recognized that a singular benefit of operating Line 1600 at an MAOP of 320 psig rather than an MAOP of 512 psig is that a pipeline failure would result in a rupture rather than a leak: “With the available known material properties for Line 1600, operating pressure of 320 psig results in hoop stress less than 20% of SMYS and it is generally accepted that pipelines operating at a sufficiently low hoop stress, below 20% of SMYS, are unlikely to fail in a rupture mode and can only fail in a leak mode.”⁴⁶

⁴⁴ *Ibid*, p. 124 (Conclusion Law 13).

⁴⁵ The Commission determined that even if Line 1600 were derated to 320 psig and, as a result, operated at a hoop stress below 20 percent of SMYS, Line 1600 would nevertheless be a transmission line functionally. The Commission provided in Conclusion of Law 11: “Regardless of the MAOP on Line 1600, and unless determined otherwise via the outcome of the pending SED Distribution Study, Line 1600 should functionally remain a transmission line and is subject to the Transmission Integrity Management Program requirements under Subpart O of the Part 192 of Title 49 of the Code of Federal Regulations.” D.18-06-028, p. 124.

⁴⁶ *Ibid*, p. 79.

However, there were three counter-considerations. First, at an MAOP of 512 psig, Line 1600 can be pigged with in-line inspection (“ILI”) technology: “From a safety standpoint, if Line 1600 remains at 512 psig, then the line can be periodically pigged with ILI and be subject to TIMP standards that may lessen the risk associated with potential Line 1600 rupture.”⁴⁷

Second, there was a reliability issue. The Commission had determined: “If the pressure of Line 1600 is lowered to 320 psig and it remains a transmission line, then its capacity would drop from 65 MMcfd to 40 MMcfd.”⁴⁸ That would be problematic. The Commission explained that “if the pressure of Line 1600 is immediately lowered without alternative capacity in place, then there is the potential for curtailments under a 1-in-10 cold day event until 2023 when gas demand is forecast to decrease below 570 MMcfd.”⁴⁹ The Commission found: “Based on parties’ presentations, and the absence of recent market studies, there is no clear cut answer pertaining to what supply is available to meet this capacity reduction. Without ‘testing’ the market via an RFO, any answer is purely speculative.”⁵⁰ The Commission concluded: “From a reliability standpoint, if Line 1600 is maintained at 512 psig, then there would be no short-term capacity issue due to the approximately 25 MMcfd capacity reduction on Line 1600.”⁵¹

Third, there was a question about the sufficiency of the Applicants’ Line 1600 records. The Commission noted that throughout the course of this proceeding, the Public Advocates Office (then the “Office of Ratepayer Advocates” or “ORA”) consistently claimed that

⁴⁷ *Ibid*, p. 80.

⁴⁸ *Ibid*, p. 37.

⁴⁹ *Ibid*, p. 80.

⁵⁰ *Ibid*, p. 37. The Commission found that before reducing the MAOP of Line 1600 to 320 psig, the Commission should require a request for offers to maintain an SDG&E transmission throughput from the Rainbow Metering Station at adequate levels, at least if the reduction of the MAOP to 320 psig were to occur before transmission system demand drops below 570 MMcf/d, the capacity of Line 3010 operating without Line 1600 in transmission service: “Before making a final determination regarding if and when the Commission should lower the MAOP of Line 1600 to 320 psig, the potential for replacing the projected 25 MMcfd capacity reduction associated with an MAOP of 320 psig for Line 1600 should be explored via an RFO....” *Ibid*, p. 81

“SoCalGas/SDG&E do not have the requisite reliable safety records to continue to operate Line 1600 at or below 512 psig without performing required pressure testing” and that

“SoCalGas/SDG&E did not retain proper records to allow them to establish MAOP [for Line 1600].”⁵² The Commission found that “the status of Line 1600 pipeline records as ‘traceable, verifiable, and complete,’ should be decided” before reducing the MAOP of Line 1600 below 512 psig.⁵³

The Commission concluded that until the Public Advocates Office’s recordkeeping issue as well as the short-term capacity issue “are addressed, the best short-term course is to keep [Line 1600] at current 512 psig or MAOP and direct the development of a hydrostatic pressure test plan....”⁵⁴

b. The Commission Concluded that the Line 1600 MAOP Should Be Reduced to 320 PSIG for the Long Term.

Having determined the course that the Applicants would be required to take in the short term to assure the safety of Line 1600, the Commission turned to the long-term question about “how long Line 1600 should be permitted to stay in service at 512 psig if there are known hook cracks and manufacturing anomalies in transmission service in high consequence areas.”⁵⁵

The Commission noted two significant benefits of reducing the Line 1600 MAOP to 320 psig with a hoop stress of less than 20% of SMYS. First, “it is generally accepted that pipelines operating at a sufficiently low hoop stress, below 20% of SMYS, are unlikely to fail in a rupture

⁵¹ *Ibid*, p. 80.

⁵² *Ibid*, p. 93. Proper records of Line 1600 are required under 49 CFR §192.105 to calculate the design pressure of the weakest element in a pipeline segment, one of the four values that MAOP of Line 1600 cannot exceed pursuant to 49 CFR §192.619(a).

⁵³ *Ibid*, p. 81.

⁵⁴ *Ibid*, p. 81.

⁵⁵ *Ibid*, p. 82.

mode and can only fail in a leak mode.”⁵⁶ The Commission observed: “In the long term, most parties and experts do not dispute that lowering the pressure of Line 1600 to below 20% SMYS would decrease the risk of Line 1600 pipeline rupture.”⁵⁷

Second, reducing the pressure in Line 1600 to 320 psig to operate the line at below 20 percent of SMYS would substantially extend the life of Line 1600. The Commission found: “If the line’s MAOP is 320 psig, we agree with experts that the line could operate indefinitely with the required maintenance.”⁵⁸

The Commission concluded in Conclusion of Law 12 that while in the short term Line 1600 should continue to operate with an MAOP of 512 psig, for the long term the MAOP should be further reduced as soon as practicable while maintaining reliability:

12. It is reasonable to maintain Line 1600 in transmission service at 512 psig in the short-term subject to the PSEP Decision Tree and Pub. Util. Code § 958; however, once short-term issues are resolved, its MAOP should be further reduced as soon as practicable while maintaining reliability.⁵⁹

Thus, in addition to requiring that the Applicants not propose to increase the diameter of Line 1600 above 16 inches or to increase the capacity of Lines 1600 and 3010 above 595 MMcfd, the Commission concluded that the Applicants should continue to operate Line 1600 at an MAOP of 512 PSIG in the short term, but the Applicants should reduce the MAOP of Line 1600 to 320 psig “as soon as practicable while maintaining reliability for the long term.”

⁵⁶ *Ibid*, p. 79.

⁵⁷ *Ibid*, p. 80.

⁵⁸ *Ibid*.

⁵⁹ *Ibid*, p. 124 (Conclusions of Law 12).

3. The Commission Ordered the Applicants to Submit a Hydrostatic Test or Replacement Plan to Continue Line 1600 in Service with an MAOP of 512 PSIG for the Short Term.

In order to permit the Applicants to continue to operate Line 1600 at an MAOP of 512 psig for the short term, the Commission decided that the Applicants should submit to SED a “hydrostatic test or replacement plan” by September 26, 2018, three months after the issuance of D.18-06-028. The Commission found in Conclusion of Law 19: “It is reasonable that no later than three months from the date of the issuance of this decision...Applicants should submit to SED a hydrostatic test or replacement plan pertaining to the existing 49.7 miles of Line 1600 corridor.”⁶⁰ The Commission ordered the Applicants to submit the hydrostatic test or replacement plan in Ordering Paragraph 7 of D.18-06-028:⁶¹

7. No later than three months from the date of the issuance of this decision, consistent with General Order 112-F Reference, Title 49 Code of Federal Regulations, Part 192—Subpart J and the National Transportation Safety Board recommendations, Pub. Util. Code § 958 and Decision 11-06-017, San Diego Gas & Electric Company and Southern California Gas Company shall submit to Safety and Enforcement Division a hydrostatic test or replacement plan pertaining to the existing 49.7 miles of Line 1600 in its present corridor.⁶²

In addressing comments on the Proposed Decision in this proceeding, the Commission said it would add the following text to Ordering Paragraph 7 to make clear the “requirements for PSEP compliance documentation:”

Applicants shall provide a detailed rationale that explains which segments of Line 1600 it proposes to hydrotest, and which segments it proposes to replace. Applicants shall also provide a detailed summary of existing physical commercial and residential structures that directly abut[sic] the edge of the easement (and any possible encroachments that lie within the easement) on Line 1600, including GPS coordinates. Based on this analysis,

⁶⁰ *Ibid*, p. 125 (Conclusion of Law 19).

⁶¹ *Ibid*, p. 128 (Ordering Paragraph 7).

⁶² *Ibid*, p. 128 (Ordering Paragraph 7).

*Applicants shall also identify proposed rerouting of the line in specific segments and/or removal or moving of specific physical structures, known at the time, due to safety compliance reasons.*⁶³

The Commission established with great specificity “The Hydrotest Minimum Requirements for 49.7 miles of Line 1600 which now operates at 512 psig.”⁶⁴

1. No later than three months from the date of the issuance of this decision, Applicants shall file and serve a comprehensive Hydrostatic Pressure Testing Plan (Plan) to conduct an integrity assessment pressure test of Natural Gas Line 1600 (Line 1600). The Plan shall include interim safety enhancement measures as defined by the Commission’s Safety Enforcement Division (SED). The Applicants shall work with SED to prepare the Plan.
2. The Plan shall also include best practices for a spike test using a hydrostatic medium.
3. The Plan and all testing and potential pipeline repair work must demonstrate stringent compliance with all applicable federal, state, and local regulations as well as adherence to all applicable industry standards and as required by SED including the Operator’s Pipeline Safety Enhancement Program (PSEP)—“Hydrostatic Pressure Test Procedure” that has been reviewed by SED and used to conduct other PSEP hydrostatic pressure tests. Applicant must list all applicable regulations and industry standards that will be followed. In cases where industry standards conflict, the most stringent requirements shall be applied.
4. Applicants shall work with SED to determine:
 - a. The maximum test pressure commensurate with the MAOP deemed safe for Line 1600; and
 - b. A prioritization list and schedule for testing of segments.
5. The Plan shall include the following minimum requirements as well as those required by SED:
 - a. Reflect a timeline for completion that is as soon as practicable.
 - b. Set forth the criteria used to define the test segment priority.

⁶³ *Ibid*, p. 111 (italics in original).

⁶⁴ *Ibid*, p. 90.

c. Measures to ensure public safety and the protection of property and the environment.

d. Identify temporary service, if necessary, to by-pass test segments and maintain natural gas service during the test period. The Plan must identify locations for temporary lateral pipelines if needed or any other safe and cost effective measure necessary to maintain service.

6. The Plan must include best available expense and capital cost projections for each prioritized segment and each test year.⁶⁵

In addition to the detailed specifications for the Hydrotest Minimum Requirements, the Commission said that “two options should also be discussed” by the Applicants in presenting their hydrostatic test or replacement plan:⁶⁶

1. Hydrotest the entire 49.7 miles of line and replace those segments that fail the test; and

2. Replace all pipeline segments in HCAs along Line 1600, thus ensuring a new pipeline without vintage pipeline characteristics that are perceived to increase the risk of Line 1600. Hydrotest in solely non-HCA segments would ensure less impact if there was a failure during hydrotesting.⁶⁷

4. Although Ordering Paragraph 7 Required that the Applicants Submit a Hydrostatic Test or Replacement Plan to SED, Ordering Paragraph 7 Did Not Provide Guidance about Review of the Hydrostatic Test or Replacement Plan by the Commission.

While Ordering Paragraph 7 provided for the submittal of a hydrostatic test or replacement plan to SED, Ordering Paragraph 7 did not provide guidance about what would happen after the submittal. D.18-06-028 contained Ordering Paragraph 15 that delegated authority to the director of SED to take three actions:

⁶⁵ *Ibid*, pp. 90-91.

⁶⁶ *Ibid*, p. 92.

⁶⁷ *Ibid*.

15. The Director of the Safety and Enforcement Division, or designee, is delegated the following authority to:

- a. Review all activities of any kind related to the hydrotesting of Line 1600;
- b. Inspect, inquire, review, examine and participate in all activities related to Line 1600;
- c. Order San Diego Gas & Electric Company and Southern California Gas Company to take any actions necessary to protect public safety.⁶⁸

However, there was no specific delegation of authority to the Director of the SED to approve or disapprove the hydrostatic test or replacement plan that the Applicants were required to submit within three months of the date of D.18-06-028.

There was certainly no authorization for SED to approve any plan that involved any increase in the capacity of Line 1600 by increasing the MAOP of Line 1600. Conclusion of Law 13 only delegated authority to SED to reduce the MAOP of Line 1600.⁶⁹

Finding of Fact 72 vaguely stated that the “unknowns of test and/or replace plans” should be addressed in “existing PSEP and companion GRC processes.” The Commission found in Finding of Fact 72: “The unknowns of test and/or replace plans such as actual costs and ROW issues, should be addressed in the existing Commission PSEP and companion GRC processes.” However, Finding of Fact 72 does not provide clarity about what happens after the Applicants submit a plan to SED pursuant to Ordering Paragraph 7.

C. The Applicants’ Line 1600 Test or Replacement Plan.

On September 26, 2018, exactly three calendar months after the June 26, 2018 issuance of D.18-06-028, the Applicants filed their Line 1600 Test or Replacement Plan in purported compliance with Ordering Paragraph 7 of D.18-06-028. The Applicants proposed four potential

⁶⁸ *Ibid*, p. 130.

⁶⁹ *Ibid*, p. 124.

design alternatives for pressure testing or replacing 49.7 miles of Line 1600 in its present corridor and presented the loaded and escalated costs of the alternatives:⁷⁰

TABLE 1
Line 1600 Test or Replace Alternative Designs Evaluated

Alternative Design	Loaded and Escalated Cost ³ (\$ millions)			Description
	Capital	O&M	Total	
Replace in HCAs/ Test in Non-HCAs ⁴	630	47	677	Replace pipeline in 14 replacement sections (<i>i.e.</i> , replace 37 miles primarily in HCAs with installation of ~43 miles of new, modern design, thicker 36-inch pipe); retrofit and hydrotest pipeline in 5 hydrotest sections; achieves compliance with Public Utilities Code section 958; enhances safety and extends lifespan of the pipeline by removing all vintage A.O. Smith flash-welded pipe in more populated areas; leaves vintage A.O. Smith flash-welded pipe in service in non-HCAs.
Full Hydrotest ⁵	92	233	325	Hydrotest entire pipeline in 22 sections, retrofit line to make fully piggable; achieves compliance with Public Utilities Code section 958 but leaves vintage A.O. Smith flash-welded pipe in service.
Full Replacement in Nearby Streets	778	-	778	Replace all vintage A.O. Smith flash-welded pipe (install ~56 miles of new, modern design, thicker 36-inch pipe); achieves maximum safety, reliability and operational enhancement and extends lifespan of the entire pipeline by abandoning or derating all vintage A.O. Smith flash-welded pipe; achieves compliance with Public Utilities Code section 958.
Full Replacement Along Highway 395	725	-	725	Replace all vintage A.O. Smith flash-welded pipe (install ~55 miles of new, modern design, thicker pipe); achieves maximum safety, reliability and operational enhancement and extends lifespan of entire pipeline by abandoning or derating all vintage A.O. Smith flash-welded pipe; achieves compliance with Public Utilities Code section 958; reduces costs and realizes construction efficiencies by installing replacement pipe in Old Highway 395.

The Applicants recommended adoption of the first alternative, “Replace in HCAs/Test in Non-HCAs.”⁷¹ That alternative involves replacing approximately 37 miles of existing Line 1600 located in High Consequence Areas (HCAs) with 43 miles of new pipeline and hydrotesting the remaining approximately 13 miles of existing Line 1600 that are located in non HCAs at a loaded and escalated cost of \$677 million.⁷²

⁷⁰ Attachment C, Line 1600 Test or Replacement Plan, p. 2.

⁷¹ *Ibid*, p. 3.

⁷² *Ibid*, p. 3.

1. All of the Four Alternatives Presented by the Applicants in Their Plan Would Result in Line 1600 Being Tested to Establish an MAOP Higher than 512 PSIG, Increasing the Combined Capacity of Lines 1600 and 3010 above 595 MMcf/d.

All of the four alternatives proposed by the Applicants including their recommended alternative, “Replace in HCAs/Test in Non-HCAs,” would result in Line 1600 being tested to a pressure that would be sufficient to establish an MAOP greater than 512 psig, increasing the combined capacity of Lines 1600 and 3010 above 595 MMcf/d.⁷³

a. The First Alternative, “Replace in HCAs/Test in Non-HCAs,” Would Result in a Line 1600 MAOP of 800 PSIG.

The Applicants’ first and recommended alternative, “Replace in HCAs/Test in Non-HCAs,” provides for pressure testing to a pressure that would be sufficient to establish an MAOP of 800 psig under 49 CFR §192.619(a)(2), the second of the four tests under 49 CFR §192.619(a) to establish the MAOP.⁷⁴ Although many numbers for pipeline diameters, pressure, and MAOP are redacted in the version of the Plan that was obtained by POC through its Public Records Act request and in the version that is posted on the San Diego Union-Tribune website, both redacted versions say for the “Replace in HCAs/Test in Non-HCAs” alternative: “This test pressure range equates to 1.5 times the original MAOP rating of 800 psig, at the lower end, to 90% of SMYS for the [redacted]-inch wall pipe at the upper end.”⁷⁵

Under 49 CFR § 192.619(a)(2)(ii), hydrotesting Line 1600 to 1.5 times 800 psig would result in an MAOP of 800 psig, more than the 512 psig permitted by the Commission for the

⁷³ See footnote 14.

⁷⁴ See footnote 14. While the Applicants propose pressure testing sufficient to support an MAOP of 800 psig under 49 CFR § 192.619(a)(2), if any of the other three values under 49 CFR § 192.619(a)(1), (3), or (4) were lower than 800 psig, the MAOP on Line 1600 would not be allowed to exceed that lowest value pursuant to 49 CFR §192.619. The Applicants assume that 49 CFR § 192.619(a)(2) will be controlling for establishing the MAOP of Line 1600, and the Petitioners make the same assumption for purposes of this Petition.

⁷⁵ *Ibid*, p. 34.

short term and far more than the 320 psig envisioned by the Commission for the long term for Line 1600.⁷⁶

b. The Second Alternative, “Full Hydrotest,” Would Result in a Line 1600 MAOP of 640 PSIG.

The Applicants’ second alternative, “Full Hydrotest,” would hydrotest Line 1600 to a “minimum test pressure of 960 psig, which is 1.5 times the most recent historical MAOP of 640 psig.”⁷⁷ Under 49 CFR § 192.619(a)(2)(ii), hydrotesting Line 1600 to 1.5 times 640 psig would result in a MAOP of 640 psig.⁷⁸ If Lines 1600 and 3010 are operated together, the capacity of Line 1600 is 100 MMcf/d, and the capacity of Line 3010 is 530 MMcf/d, resulting in a combined capacity of 640 MMcf/d,⁷⁹ more than allowed under D.18-06-028, Ordering Paragraph 1.⁸⁰

c. The Third Alternative, “Full Replacement in Nearby Streets,” Would Result in a Line 1600 MAOP of 800 PSIG.

The Applicants’ third alternative, “Full Replacement in Nearby Streets,” would result in the “restoration” of an 800 psig MAOP for Line 1600: “Full replacement of 1949 A.O. Smith pipe in Line 1600 would allow the restoration of an 800 psig MAOP on Line 1600, thus enhancing reliability of service to customers.”⁸¹ Applicants would hydrotest Line 1600 in accordance with 49 CFR § 192.619(a)(2)(ii) to 1.5 times 800 psig, resulting in the MAOP of 800 psig.⁸²

The Applicants are quick to explain that while the Line 1600 MAOP would be set at 800 psig, they would plan to operate Line 1600 so that volume flowing through Lines 1600 and 3010

⁷⁶ See footnotes 14 and 76.

⁷⁷ *Ibid*, p. 71.

⁷⁸ See footnotes 14 and 76.

⁷⁹ Ex. SDGE-12, p. 41 (footnote 71).

⁸⁰ D-18-06-028, p. 127. It is concerning that under this alternative, the test pressure would only be conducted to demonstrate an MAOP of 640 psig rather than to the MAOP of 800 psig envisioned under the Applicants’ three other alternatives, given the Applicants assurances that Line 1600 was safe to operate at 800 psig.

⁸¹ *Ibid*, p. 77. The Applicants assume that the MAOP of the entirely new Line 1600 would be established under 49 CFR § 192.619(a)(2)(ii). See footnotes 14 and 76.

⁸² See footnotes 14 and 76.

combined would not exceed 595 MMcf/d: “SoCalGas’ plan would be to operate so as not to exceed the capacity requirement of the Commission Decision, even though the line would be constructed and tested to allow for the potential to operate at an MAOP of 800 psig.”⁸³ Nevertheless, if the Applicants establish a MAOP of 800 psig for Line 1600, the combined capacity of Line 1600 and 3010 operating together would violate the Ordering Paragraph 1 restriction of the combined capacity to 595 MMcf/d.

The Applicants contend that permitting the capacity of Lines 1600 and 3010 operating together to exceed 595 MMcf/d would be beneficial. In fact, the Applicants claim two benefits of raising the Line 1600 MAOP to 800 MMcf/d. They say that the “Full Replacement in Nearby Streets” alternative “provides the opportunity to restore the MAOP of Line 1600 to 800 psig, which matches that of the other transmission pipelines it will interconnect with and would allow Line 1600 to provide greater benefit in the event of an outage or pressure reduction on Line 3010.”⁸⁴

Ordering Paragraph 1 denied “any proposal” to increase the combined capacity of Lines 1600 and 3010 above 595 MMcf/d “without specific and detailed information.”⁸⁵ Neither of the Applicants’ purported benefits of allowing an MAOP of 800 psig for Line 1600 is supported by a “specific and detailed justification.” As for the first purported benefit, having an MAOP “that matches that of the other transmission pipelines it will interconnect with,” the Applicants fail to identify any pipelines that interconnect with Line 1600 that have an MAOP of 800 psig. Further, even if there were any such pipelines, the Applicants fail to provide any rationale for why the MAOPs should be the same. If Line 1600 had an MAOP of 512 psig or 320 psig, installation of a pressure regulator would permit an interconnection with a line that has a higher MAOP.

⁸³ *Ibid*, p. 74.

⁸⁴ *Ibid*, p. 73.

⁸⁵ D.18-06-028, p. 127.

As for the second purported benefit, providing capacity “in the event of an outage or pressure reduction on Line 3010,” the Applicants are recycling their argument that the Commission should permit them to install redundant capacity, equating “redundancy” with “resiliency.” The Commission decisively rejected the Applicants’ proposal to expand the Commission’s existing capacity adequacy standard to include a “redundancy” component: “The Applicants fail to prove a standard equating “resiliency” to “redundancy” should be implemented.”⁸⁶ The Commission found that “it is reasonable to maintain the 1-in-10 and 1-in-35 cold day standards, which already take into account the Utility’s ability to respond to emergencies.”⁸⁷

d. The Fourth Alternative, “Full Replacement Along Highway 395,” Would Result in a Line 1600 MAOP of 800 PSIG.

The Applicants’ fourth alternative, Full Replacement Along Highway 395,” would also result in an MAOP of 800 psig: “This also provides the opportunity to restore the MAOP of Line 1600 to 800 psig, which matches that of the other transmission pipelines with which it will interconnect.”⁸⁸ The Applicants tout the restoration of the “full operational capability” of Line 1600 with an MAOP of 800 psig: “Full replacement of 1949 A.O. Smith pipe in Line 1600 would allow SDG&E and SoCalGas to potentially restore an 800 psig MAOP on Line 1600, with Commission approval, thus returning the full operational capability to serve customers.”⁸⁹

The “Full Replacement Along Highway 395” alternative is the Applicants’ favorite, even though it is not their recommended alternative. The Applicants say:

Compared to the cost of the Replace in HCA/Test in Non-HCA alternative proposed, the loaded and escalated incremental cost to replace all the vintage A.O. Smith pipe is anticipated to be approximately \$48 million. Although this design alternative offers

⁸⁶ *Ibid*, p. 31.

⁸⁷ *Ibid*, pp. 30-31.

⁸⁸ *Ibid*, p. 79. *See* footnotes 14 and 76.

⁸⁹ *Ibid*, p. 82.

the greatest safety enhancement benefits for a modest 7% increase in cost, SDG&E and SoCalGas do not propose this alternative.⁹⁰

The Applicants' three alternatives that would result in an MAOP of 800 psig and the hydrotest alternative which would result in an MAOP of 640 psig disregard the clear requirement in Ordering Paragraph 1 of D.18-06-028 that the Applicants should not make any proposal for a pipeline greater than 16-inches in diameter or which involves a replacement of Line 1600 that "increases demand-forecast capacity above the current capacity of 595 million cubic feet per day."

2. The Applicants Ignore the Commission's Vision of Derating of Line 1600 to 320 PSIG for the Long Term.

The Applicants also ignore the Commission's vision of derating Line 1600 to 320 psig in the long term to extend the life of Line 1600 indefinitely while assuring that a rupture would not occur. By proposing to "restore" an MAOP of 800 psig or, in the case of the "Full Hydrotest" alternative, an MAOP of 640 psig, the Applicants' Plan moves in exactly the opposite direction from what the Commission envisioned in D.18-06-028.

The Applicants are candid about how they see their alternatives as being for the long term, simply ignoring the Commission's requirement of derating "as soon as practicable while maintaining reliability."⁹¹ The Applicants say in support of their recommended "Replace in HCAs/Test in Non-HCAs" alternative:

As discussed in greater detail in this Plan, although replacement of the entirety of Line 1600 may be a more cost effective investment in the long term, replacing portions of Line 1600 in HCAs and pressure testing portions of Line 1600 in non-HCAs is a reasonable approach to bringing Line 1600 into compliance with the

⁹⁰ *Ibid*, p. 84.

⁹¹ D.18-06-028, p.124 (Conclusion of Law 12).

Commission's directives in D.11-06-017, D.14-06-007, D.18-06-028, and Public Utilities Code section 958 as soon as practicable.⁹²

The Applicants explain that the reason for their failure to recommend the "Full Hydrotest" alternative, the least expensive of their four alternatives, is that it does not "resolve long term safety considerations," again ignoring the derating alternative:⁹³

While it is the least expensive, in terms of minimally achieving compliance with Public Utilities Code section 958, it does not resolve long term safety considerations associated with the legacy pipe in populated areas.

As with the Applicants' disregard for the Commission's clear directive that they should not propose to increase the capacity of the SDG&E transmission system from Rainbow above 595 MMcf/d, the Applicants completely disregard the Commission's avowed intent to pursue a "long term" solution for Line 1600 by derating the line from transmission to an MAOP of 320 psig.

3. Although D.18-06-028 is Unclear, the Applicants Are Quite Clear that They Intend to Proceed with their Recommended Line 1600 Solution Without an Approved Cost Forecast and With Only an After-the-Fact Reasonableness Review.

D.18-06-028 provides little guidance about whether the Applicants should obtain Commission approval of a forecast application or, alternatively, rely on an after-the-fact reasonableness review to be permitted to recover incurred Line 1600 costs, saying only in Finding of Fact 72: "The unknowns of test and/or replace plans such as actual costs and ROW issues, should be addressed in the existing Commission PSEP and companion GRC processes."⁹⁴

Although D.18-06-028 is unclear about the process to be followed after the Applicants submit their hydrostatic test or replacement plan to SED as required by Ordering Paragraph 7,

⁹² *Ibid*, p. 53.

⁹³ *Ibid*, p. 72.

⁹⁴ D.18-06-028, p. 122.

the Applicants are completely clear about their intent to proceed with implementation of their Plan after SED review, leaving Commission review to an after-the-fact reasonableness review proceeding: “SDG&E and SoCalGas intend to present costs incurred for projects completed prior to 2022 for reasonableness review in a General Rate Case application and to include forecasts of testing and replacement costs for years 2022 and beyond in General Rate Case applications, consistent with D.16-08-003.”⁹⁵

The Applicants’ reference to D.16-08-003 is inapposite to the Line 1600 situation. D.16-08-003 was prospective. The Decision addressed a proposal by Commission staff for future PSEP proceedings:

Staff’s Proposal provides for two reasonableness review applications for projects completed as part of the PSEP up to and including 2017, a forecast application for projects planned for 2017 and 2018, and for the 2019 General Rate Case to include all PSEP costs and projects not yet reviewed as well as all forecasted projects. With the 2019 GRC, all Pipeline Safety Enhancement Plan projects will be incorporated into the General Rate Case schedule and will not be subject to special applications.⁹⁶

When the Commission issued D.16-08-003 on August 18, 2016, the Applicants’ proposal to construct a new pipeline and to derate Line 1600 was already pending in the A.15-09-013 forecast proceeding. In D.14-06-007, the Commission provided that the Applicants’ proposal to remediate Line 1600 by constructing a new pipeline and then pressure testing Line 1600 should be considered in a separate application.⁹⁷ That Application was A.15-09-013. Insofar the treatment of Line 1600 and the then-proposed Line 3602 were already the subject of the then-pending A.15-09-013, the forward-looking D.16-08-003 did not address Line 1600. The appropriate treatment of Line 1600 is properly a subject for this proceeding, A.15-09-013.

⁹⁵ *Ibid*, p. 5.

⁹⁶ D.16-08-003, p. 11 (August 18, 2016).

⁹⁷ D.14-06-007, pp. 16-17.

III. PROPOSED MODIFICATIONS OF D.18-06-028.

After a review of D.18-06-028 and the subsequent examination of the September 26, 2018 Line 1600 Test or Replacement Plan, it is clear that several modifications to D.18-06-028 are necessary. The primary purpose of the modifications is to establish a process for transparent and effective public review through the hearing process of the hydrostatic test or replacement plan that the Commission required in Ordering Paragraph 7 of D.18-06-028 and to provide the public with an opportunity to present potentially more effective alternatives.

Establishing a process for effective public participation is particularly necessary because the Applicants elected to ignore two of the Commission's clearly expressed requirements for Line 1600. First, the Applicants ignored the Commission's requirement established in Ordering Paragraph 1 that the SDG&E transmission pipelines that extend south from the Rainbow Metering Station have a combined capacity that is no more than the current 595 MMcf/d. Second, the Applicants ignored the Commission's intent that for the long term Line 1600 shall be derated to an MAOP of 320 psig so that the possibility of rupture is eliminated and the pipeline can remain in service indefinitely.

An opportunity for public review through the hearing process is also necessary in the interest of containing the cost of the short-term plan for Line 1600 to assure that costs that the Applicants will seek to recover from ratepayers are kept within reasonable limits. Given that purpose of the plan to pressure test or replace Line 1600 is to assure the safety of Line 1600 until Line 1600 can be derated to an MAOP of 320 psig for the long term, self-evidently the plan for the short term should be as economical and efficient as possible.

With those objectives in mind, the Petitioners propose the following limited but important modifications to D.18-06-028 discussed below.

A. Ordering Paragraph 7 Should Be Revised to Insert the Requirements for PSEP Compliance Documentation that the Commission Found to Be Necessary in Response to Comments on the Proposed Decision in this Proceeding.

Ordering Paragraph 7 should be revised to include the requirements for PSEP compliance documentation that the Commission found to be necessary after a review of comments on the Proposed Decision in this proceeding. As explained in Section 14 of D.18-06-028 addressing comments on the Proposed Decision, the Commission presented the additional language for inclusion in Ordering Paragraph 7 as follows:

Applicants shall provide a detailed rationale that explains which segments of Line 1600 it proposes to hydrotest, and which segments it proposes to replace. Applicants shall also provide a detailed summary of existing physical commercial and residential structures that directly abut[sic] the edge of the easement (and any possible encroachments that lie within the easement) on Line 1600, including GPS coordinates. Based on this analysis, Applicants shall also identify proposed rerouting of the line in specific segments and/or removal or moving of specific physical structures, known at the time, due to safety compliance reasons.⁹⁸

However, the additional language apparently was inadvertently omitted from Ordering Paragraph 7. The Petitioners do not know whether the Applicants have provided to SED the information required by omitted language. D.18-06-028 should be modified to include the omitted language as intended by the Commission.

B. Ordering Paragraph 7 and the Related Conclusion of Law 19 Should Be Modified to Require that Applicants File their Hydrostatic Test or Replacement Plan in this Proceeding for Public Review by Parties and the Commission

Ordering Paragraph 7 should be modified to require that after SED review of the hydrostatic test or replacement plan that is submitted within three months from the date of issuance of D.18-06-028, a review that has already occurred as shown by the January 15, 2018 letter attached as Attachment 2, the Applicants shall file their hydrostatic test or replacement

plan in this proceeding with supporting documentation including direct testimony and forecasted costs to permit interested parties, the Public Advocates Office, and the Commission to develop a record of review of the hydrostatic test and replacement plan and to present alternative recommendations.

The Plan that the Applicants submitted to the SED should be exposed to public review through the Commission's hearing process. First, the Applicants' proposal to increase the MAOP of Line 1600 to 800 psig under three of their alternatives and to 640 psig under the "Full Hydrotest" alternative would result in increasing the overall capacity of Line 1600 and Line 3010 operating together above the current capacity of 595 MMcf/d in violation of Ordering Paragraph 1 of D.18-06-028.

Second, the Applicants make it clear that none of their four alternatives for Line 1600 would lead to derating Line 1600 "as soon as practicable while maintaining reliability" as intended by the Commission.⁹⁹ The Applicants present their preferred alternative, "Replace in HCAs/Test in Non-HCAs," as being for long term to the extent of replacing 37 miles of Line 1600 with approximately 43 miles of new pipe in HCAs.¹⁰⁰ The Applicants suggest that the 13 miles of Line 1600 located in non-HCAs will have to be replaced in the future,¹⁰¹ failing to give even the slightest lip service to the Commission's clearly expressed intent to have the Applicants derate Line 1600 to distribution service for the long term.¹⁰²

Third, all of the four alternatives presented by the Applicants are vastly more expensive than envisioned by the Commission in D.18-06-028. The Commission thought that the cost of

⁹⁸ D.18-06-028, p. 111.

⁹⁹ *Ibid*, p. 124 (Conclusion of Law 12)>

¹⁰⁰ Line 1600 Test or Replacement Plan, p. 2.

¹⁰¹ *Ibid*. p. 84.

¹⁰² D.18-06-028, pp. 82-86.

hydrotesting, as difficult as the Applicants said it would be for Line 1600, would result in direct costs of approximately \$112.9 million.¹⁰³ Although loading and escalating the \$112.9 million estimate would result in a higher number to compare to the estimates presented in the Applicants' Line 1600 Test or Replacement Plan, it is abundantly apparent that the Commission did not expect that the cost of short term measures aimed at permitting temporary continued operation of Line 1600 at an MAOP of 512 psig would result in costs as high as the extravagant projections presented in the Applicants' Line 1600 Pressure Test and Replacement Plan.

The Commission could not have foreseen that the Applicants would disregard the clear directives in D.18-06-028 and propose hydrostatic testing or replacement that would vary sharply from the requirements of D.18-06-028 and the cost expectations evidenced in D.18-06-028. Requiring the Applicants to file their proposal in this proceeding with supporting documentation including testimony and forecasted costs will permit interested parties, the Public Advocates Office, and the Commission an opportunity to conduct discovery, to examine the workpapers underlining the projections in the Line 1600 Test or Replacement Plan, to submit testimony that provides recommendations for the Commission's consideration, and to test witnesses through the hearing process.

Accordingly, the Petitioners propose that the Commission modify Ordering Paragraph 7 to require that the Applicants' hydrostatic testing or replacement plan be submitted in this proceeding for review. The proposed revised Ordering Paragraph 7 would read as follows, including the language that was apparently inadvertently omitted from the paragraph:

7. No later than three months from the date of the issuance of this decision, consistent with General Order 112-F Reference, Title 49 Code of Federal Regulations, Part 192—Subpart J and the National Transportation Safety Board recommendations, Pub. Util. Code § 958 and Decision 11-06-017, San Diego Gas & Electric Company

¹⁰³ D.18-06-028, p. 86.

and Southern California Gas Company shall submit to Safety and Enforcement Division a hydrostatic test or replacement plan pertaining to the existing 49.7 miles of Line 1600 in its present corridor. *Applicants shall provide a detailed rationale that explains which segments of Line 1600 it proposes to hydrotest, and which segments it proposes to replace. Applicants shall also provide a detailed summary of existing physical commercial and residential structures that directly abut the edge of the easement (and any possible encroachments that lie within the easement) on Line 1600, including GPS coordinates. Based on this analysis, Applicants shall also identify proposed rerouting of the line in specific segments and/or removal or moving of specific physical structures, known at the time, due to safety compliance reasons. After review of the hydrostatic test or replacement plan by the Safety and Enforcement Division, SDG&E and SoCalGas shall submit their hydrostatic test or replacement plan in this proceeding with supporting documentation including direct testimony and forecasted costs.*

Consistent with the proposed modification of Ordering Paragraph 7 of D.18-06-028,

Conclusion of Law 19 should be revised as follows:

19. It is reasonable that no later than three months from the date of the issuance of this decision, consistent with General Order 112-F Reference, Title 49 Code of Federal Regulations, Part 192— Subpart J and National Transportation Safety Board recommendations, Section 958 of the Public Utilities Code and D.11-06-017, Applicants should submit to SED a hydrostatic test or replacement plan pertaining to the existing 49.7 miles of Line 1600 corridor. After review of the hydrostatic test or replacement plan by the Safety and Enforcement Division, SDG&E and SoCalGas should submit their hydrostatic test or replacement plan in this proceeding with supporting documentation including direct testimony and forecasted costs.

C. An Alternative to Modifying Ordering Paragraph 7 and the Related Conclusion of Law 19 Would Be to Require the Applicants to Submit Their Plan as a New Application.

An alternative to modifying Ordering Paragraph 7 and the related Conclusion of Law 19 as recommended above would be to require the Applicants to submit their plan as a new application. This alternative approach would have the benefit of the Applicants' Plan being considered in a 2019 application proceeding instead of the four year old A.15-09-013.

However, if the Applicants were to submit their Plan in a new application, the Commission could lose the potential benefits that could flow from reopening A.15-09-013. One benefit of reopening A.15-09-013 rather than commencing a new proceeding is that the copious record that was developed in A.15-09-013 would remain available to the Commission to support a decision about the Applicants' Plan.

Another benefit of reopening A.15-09-013 is that the Administrative Law Judge ("ALJ") who oversaw the development of the A.15-09-013 record would, absent reassignment, be available to manage the reopened proceeding and to produce a proposed decision. Having an ALJ who is familiar with the existing record would be more likely to accelerate reaching a proposed decision about the Applicants' Plan than if a new ALJ were assigned to a new proceeding.

D. Finding of Fact 72 Should Be Modified to Be Consistent with the Modification to Ordering Paragraph 7.

Ordering Paragraph 72 should be modified to be consistent with the modification of Ordering Paragraph 7 requiring the Applicants to submit their hydrostatic Test or Replacement Plan after review by the SED. Currently, Finding of Fact 72 reads as follows:

72. The unknowns of test and/or replace plans such as actual costs and ROW issues, should be addressed in the existing Commission PSEP and companion GRC processes.¹⁰⁴

To be consistent with the revision to Ordering Paragraph 7, Finding of Fact 72 should be modified to provide:

72. SDG&E and SoCalGas should submit a Line 1600 hydrostatic test or replacement plan to the Safety and Enforcement Division within three months from the date of issuance of this decision and, upon Safety and Enforcement Division review, should submit the hydrostatic test or replacement plan to the Commission with supporting documentation including direct testimony and

¹⁰⁴ D.18-06-028, p. 122.

forecasted costs for consideration by the Commission in this proceeding.

- E. Ordering Paragraph 19 Should Be Revised to Keep this Proceeding Open so that the Commission Can Receive the Hydrostatic Testing and Replacement Plan that the Applicants Submit to the Commission in Accordance With Ordering Paragraph 7, As Modified.**

Ordering Paragraph 19 should be revised to keep this proceeding open so that the Commission can receive the hydrostatic testing and replacement plan that the Applicants submit to the Commission in accordance with the modified Ordering Paragraph 7. Currently, Ordering Paragraph 19 closes A.15-09-013. Ordering Paragraph 19 should be revised to read as follows:

19. This Application 15-09-013 remains open.

IV. CONCLUSION.

For the reasons set forth above, the Petitioners respectfully request that Finding of Fact 72, Conclusion of Law 19, Ordering Paragraph 7, and Ordering Paragraph 19 be revised as proposed herein and as shown in Attachment 4.

Respectively submitted,

/s/ Alison Seel

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Dated: May 31, 2019

ATTACHMENT 1

San Diego Union-Tribune Article:
What you need to know about SDG&E plan to test or
Replace a 50-mile natural gas line
(February 24, 2019)



SPECIAL SALE | \$1 FOR 4 MONTHS

ENERGY

What you need to know about SDG&E plan to test or replace a 50-mile natural gas line



A San Diego Gas & Electric crew works on a natural gas pipeline in Pacific Beach. Ted Walton/SDG&E

By ROB NIKOLEWSKI

FEB. 24, 2019
6 AM



Drivers should prepare themselves for traffic slowdowns in some locations starting early next year because a major natural gas pipeline project that will take about four years to complete will break ground.

A division of the California Public Utilities Commission recently [signed off on a hybrid plan](#) by San Diego Gas & Electric that replaces 37 miles of a natural gas pipeline that runs north and south for about 50 miles in San Diego County. SDG&E will hydrotest the remaining 13 miles.

“We are going to work with the communities (affected) to minimize the disruption and to ultimately end up with a pipeline system that is safer and more reliable,” said [Rodger Schwecke](#), [senior vice president of gas, transmission, storage and engineering for SDG&E](#).

Crews will start work on Line 1600, which runs from Rainbow Station in the north to Mission Station in the south, in the first quarter of 2020.

ADVERTISING

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“We will spend the rest of this year on design and engineering as well as work with individual cities on permitting and traffic planning,” SDG&E senior communications manager [Jennifer Ramp](#) said.

The job will be done in stages, broken up into 19 different sections over the course of the project that SDG&E and its sister utility Southern California Gas have [estimated will cost \\$677 million](#).

That works out to a 1.2 percent increase in the monthly bills of a typical SDG&E customer using 24 therms of gas, which translates to 42 cents more per month.

The \$677 million estimate does not take into account tested lines that fail and need to be repaired or replaced.



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What Do Finances and a Healthy Relationship Have in Common? [↗](#)

By Ameriprise Financial

“If you have more failures, more repairs, (the cost) will fluctuate, obviously,” Schwecke said.

If the costs go over, the Safety Enforcement Division of public utilities commission said the utility would need to apply to the CPUC for more money. “Without additional authorization from the CPUC, any cost beyond what is authorized would need to be covered by utility shareholders at no cost to the ratepayers,” said [CPUC spokeswoman Terrie Prosper](#) in an email.

SDG&E was required to examine their pipelines because of a tragedy involving another California utility.

In the aftermath of a Pacific Gas & Electric natural gas pipeline [explosion in San Bruno in 2010 that killed eight people](#), the [California Legislature passed new regulations](#) that called on the state’s investor-owned utilities to replace or pressure-test all their gas lines.

Line 1600 was originally built in 1949 and rather than hydrotest it, SDG&E officials for years wanted to largely replace the line with a brand new pipeline 36 inches wide. Under the proposal the utility submitted to the CPUC, the bills of typical residential customers would increase by 57 cents a month.

In June the [utilities commission turned down the plan](#) in a 5-0 vote, saying it wasn’t needed.

The commission sent SDG&E back to the drawing board, telling the utility to come up with alternatives.

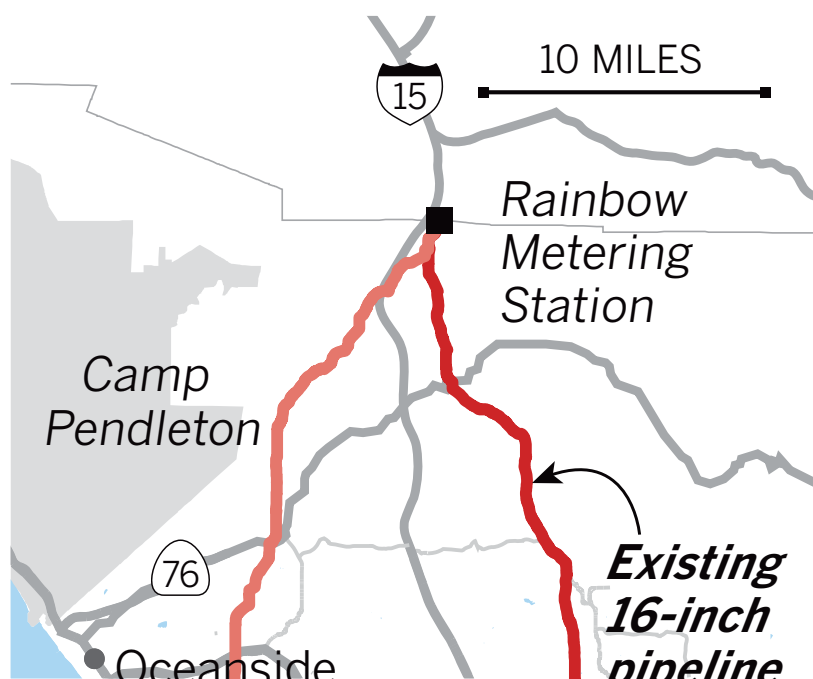
SDG&E and SoCalGas returned with four suggestions to the commission, and the Safety and Enforcement Division signed off on the hybrid plan to strength-test 13 miles of Line 1600 and replace the remaining 37 miles.

Some 16 inches wide, Line 1600 is one of two of the primary natural gas lines serving the San Diego area. The other is Line 3010, a 30-inch pipeline that provides 90 percent of SDGE's gas capacity.

While Line 1600 provides only about 10 percent of capacity for the area, it is a critical line because it is the sole supply of natural gas for about 150,000 customers in eastern Fallbrook, Valley Center, Escondido, Rancho Bernardo, Rancho Peñasquitos, Poway, Scripps Ranch, Kearny Mesa and Serra Mesa.

SDG&E's pipeline project

Starting in 2020, some 50 miles of an SDG&E natural gas pipeline will be replaced or tested. The project is estimated to take four years to complete. Here are the sections that will be replaced first, starting in 2020.



Replacement schedule for 2020

1. Midway Drive, Escondido: 2.2 miles, starting at Lincoln Avenue and Midway Drive

2. Black Mountain Road, Poway: 4.5 miles, starting near the intersection of



the intersection of Scripps Poway Parkway and Interstate 15, runs south on Black Mountain Road to Miramar Road

3. Serra Mesa: 4.4 miles, starting near the intersection of Ridgehaven Court and Ruffin Road

4. Kearny Mesa: 1.4 miles, starting south of the 52 freeway near the intersection of Ruffin Road and

Of the 19 distinct work sites on the project, 14 segments in more populated areas will see lines replaced while five segments in more rural areas will undergo hydrotesting — a high-pressure water test — to make sure the lines are up to par.

“If you have a failure or a leak or if a rupture of the pipeline occurs during the hydrotest, you’re obviously going to have to dig up that section of pipeline,” Schwecke said. “If you get to a point where you’re just having too many failures, we have to replace the whole section. We don’t know until we start the hydrotest.”

SDG&E’s schedule will emphasize working on more populated areas first.

“We want to make sure we have the safest operating pipeline that we can in the shortest period of time,” Schwecke said. “We want to get away from the populated areas as quickly as possible.”

The company anticipates construction time to install new pipeline to take about four weeks per mile.

“As our crews will be working primarily in larger, multi-lane roads, traffic flow is anticipated to be maintained in both directions at all times,” Ramp said via email. “It will be necessary to block off one lane so crews can safely manage construction in and around the trench.”

Each of the 19 sections can be completed individually and work on some sections can overlap, Ramp said, to help reduce the time needed to finish the project.

A 2.2-mile segment on Midway Drive in Escondido is scheduled to go first, some time in the first three months of January. Three other segments, including one near the intersection of Scripps Poway Parkway and Interstate 15, will follow later that year.

“We’ve already sat down with the cities of Escondido and Poway to look at what their needs are and hours that would work for them, the different roadways that would be impacted,” Ramp said. “And we will also be working with school districts as well.”

Four years to complete the project seems like a long time, but that timetable tracks with SDG&E’s earlier estimates.

“The process is sometimes slower than we anticipate,” Schwecke said, citing delays for permitting, interruptions due to weather and other restrictions. “Would I like to have done it in six months? Yes I would, but the reality is it will take four years to complete all 19 of these projects.”

The utilities weighed three other options before settling on the current plan:

1. strength-testing Line 1600, estimated to cost \$325 million
2. replacing all of Line 1600 along nearby streets, estimated at \$778 million
3. full replacement of Line 1600 along Highway 395, estimated to cost \$725 million

Why not go with the least expensive plan?

Schwecke said the \$325 million option called only for testing the line and did not include costs needed to repair or replace segments that failed.

“Ultimately, will your costs be cheaper?” he asked. “You start rolling the dice that you don’t have the repairs that you could potentially have that would put you over the costs and you would not have a full, new line.”

The 36-inch-wide pipeline proposal the CPUC rejected last year was estimated to cost \$639 million. That’s \$38 million less than the \$677 million project that is moving forward. Why would an estimate that would install a brand new line come in higher than an estimate to test/repair/replace sections of an existing line?

The Safety and Enforcement Division and SDG&E said the \$639 million was an old estimate from four years ago and current prices for steel, material and labor have gone up. In addition, Ramp said, the 36-inch proposal did not include the southernmost five miles of Line 1600.

SDG&E’s Line 1600 test or replace project

Estimated to take four years, starting in 2020

Sites scheduled for 2020 (in order):

1. Midway Drive Replacement, Escondido, 2.2 miles, starting at the crossing of Lincoln Avenue and Midway Drive
2. Black Mountain Road Replacement, Poway, 4.5 miles, starting near the intersection of Scripps Poway Parkway and 15 Freeway, runs south on Black Mountain Road until reaching Miramar Road
3. Serra Mesa Replacement, 4.4 miles, beginning near the intersection of Ridgeway Court and Ruffin Road
4. Kearny Mesa Replacement, 1.4 miles, starting south of 52 Freeway near the intersection of Ruffin Road and Kearny Villa Road

ATTACHMENT 2

Lee Palmer, Deputy Director – Safety and Enforcement,
California Public Utilities Commission letter to
Roger Schwecke, Senior Vice President, Gas Operations and
System Integrity, Southern California Gas Company
Re: SED to SDG&E and SoCalGas Submission of Line 1600
Hydrostatic Test or Replacement Plan in Fulfillment of PSEP
for Review and Approval
(January 15, 2019)

PUBLIC UTILITIES COMMISSION

505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3208



January 15, 2019

Roger Schwecke, Senior Vice President
Gas Operations and System Integrity
Southern California Gas Company
555 West 5th Street, GT21C3
Los Angeles, CA 90013

Safety and Enforcement Division's (SED) Response to San Diego Gas and Electric Company's (SDG&E) and Southern California Gas Company's (SoCalGas) Submission of Line 1600 Hydrostatic Test or Replacement Plan in Fulfillment of Pipeline Safety Enhancement Plan (PSEP) for Review and Approval

Dear Mr. Schwecke:

Background

California Public Utilities Commission (Commission) Decision (D.) 18-06-028, Ordering Paragraph (OP) #7 states: "No later than three months from the date of the issuance of this decision, consistent with General Order 112-F Reference, Title 49 Code of Federal Regulations, Part 192—Subpart J and the National Transportation Safety Board recommendations, Pub. Util. Code § 958 and Decision 11-06-017, San Diego Gas & Electric Company and Southern California Gas Company shall submit to Safety and Enforcement Division a hydrostatic test or replacement plan pertaining to the existing 49.7 miles of Line 1600 in its present corridor." Further, D.18-06-028 Conclusion of Law (COL) #14 states: "The Commission's requirement to have a hydrotest plan for Line 1600 is a necessary measure for compliance with Pub. Util. Code § 958." D.18-06-028 Finding of Fact (FOF) #72 states that "the unknowns of test and/or replace plans such as actual costs and ROW issues, should be addressed in the existing Commission PSEP and companion GRC processes." D.18-06-028 also authorizes SED to "oversee the Applicants' compliance with Pub. Util. Code § 958 and PSEP consistent with directives in prior decisions and OP 15 in this decision. Any costs associated with PSEP work are proposed and managed through PSEP and rate case proceedings according to already existing CPUC institutionalized processes." (D.18-06-028, at 107.)

SDG&E and SoCalGas' Plan

Pursuant to D.18-06-028, OP #7, San Diego Gas & Electric Company (SDG&E) and Southern California Gas Company (SoCalGas) timely submitted the proposed hydrostatic test or replacement plan pertaining to the existing 49.7 miles of Line 1600 to Safety and Enforcement Division (SED) on September 26, 2018.

SDG&E and SoCalGas indicated that the report analyzed and discussed four design alternatives for the hydrostatic testing and/or replacement plan for Line 1600. SDG&E and SoCalGas reported that they approached the four design alternatives with the following objectives: (1) to enhance public safety; (2) apply risk assessment and management principles; (3) comply with the Commission's Directives, Decisions and the Public Utilities Code section 958; (4) maximize the cost effectiveness of safety investments; and (5) minimize customer impacts.

SDG&E and SoCalGas evaluated and submitted the following four design alternatives and proposed one of the design alternatives for SED's review and approval:

- (1) Replacing 37 miles of Line 1600 pipeline in High Consequence Areas (HCAs) and hydrotesting approximately 13 miles of Line 1600 pipeline in non-HCAs (Replace in HCA/Test in Non-HCA alternative);
- (2) Hydrostatic strength testing (hydrotest or test) of the entire length of Line 1600 (Full Hydrotest alternative);
- (3) Full replacement of Line 1600, routing in nearby streets in the north (Full Replacement in Nearby Streets alternative); and
- (4) Full replacement of Line 1600, routing along Highway 395 in the north (Full Replacement Along Highway 395 alternative).

SDG&E and SoCalGas identified known specific segments of the Line 1600 pipeline that required rerouting due to safety and serviceability reasons and shared that information with SED. SED conducted a joint field inspection of the identified sites with SDG&E personnel and its contractor to evaluate the existing safety conditions, constructability and serviceability of Line 1600. After the field inspections, SED agreed with SDG&E's and SoCalGas' proposed reroute of many segments of Line 1600 due to safety and serviceability reasons.

SDG&E and SoCalGas reported that after careful evaluation of the four design alternatives, it selected to execute design alternative #1. SED observed in the SoCal Gas /SDG&E analysis that design alternatives #3 and #4 were scored as having the maximum safety margin and reliability. SED inquired the rationale for choosing the design alternative #1. SDG&E and SoCalGas indicated that it chose design alternative #1 after considering the Commission's directives in D.18-06-028.

SED's Approval

SED has reviewed and analyzed the hydrostatic test or replacement plan that SDG&E and SoCalGas submitted, including its proposal to execute the design alternative #1. SED approves the SDG&E and SoCalGas' proposed PSEP replacement of 37 miles of Line 1600 pipeline in High Consequence Areas (HCAs) and hydrotesting approximately 13 miles of the remainder of Line 1600 pipeline in non-HCAs (Replace in HCA/Test in Non-HCA alternative). SED requests to be apprised of any changes in the proposed plan, along with the Management of Change record. SED directs that SDG&E and SoCalGas submit to SED all the required PSEP

construction notifications, scope of work, engineering design data, welding and fabrication information no less than 60 days prior to construction, for SED's safety assurance review and inspections. In addition, SED requests that SDG&E and SoCalGas maintain and submit to SED periodically, a comprehensive management of change records that captures changes, particularly in design, materials and processes. SED further request that appropriate local public officials be notified in accordance with law.

If you have any questions, please contact Matthewson Epuna at (213) 576-7014 or by e-mail at Matthewson.Epuna@cpuc.ca.gov.

Sincerely,

Cc:

Division 3 | Page 3 of 4

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Shirley Arazi, SoCalGas – Regulatory Affairs



Lee Palmer

Deputy Director - Safety and Enforcement
California Public Utilities Commission

ATTACHMENT 3

SoCalGas and SDG&E Line 1600 Test or Replacement Plan

Line 1600 Test or Replacement Plan

September 26, 2018



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I. EXECUTIVE SUMMARY

In compliance with California Public Utilities Commission (Commission) Decision (D.) 18-06-028, San Diego Gas & Electric Company (SDG&E) and Southern California Gas Company (SoCalGas) submit this proposed Line 1600 Test or Replacement Plan.¹ SDG&E and SoCalGas evaluated four potential design alternatives for the pressure test or replacement of 49.7 miles of Line 1600 in its present corridor: (1) replacing Line 1600 pipeline in High Consequence Areas (HCAs)² and hydrotesting Line 1600 pipeline in non-HCAs (Replace in HCA/Test in Non-HCA alternative); (2) hydrostatic strength testing (hydrotest or test) the entire length of Line 1600 (Full Hydrotest alternative); (3) full replacement of Line 1600, routing in nearby streets in the north (Full Replacement in Nearby Streets alternative); and (4) full replacement of Line 1600, routing along Highway 395 in the north (Full Replacement Along Highway 395 alternative). The alternative designs evaluated by SDG&E and SoCalGas in preparing this Plan are summarized in Table 1 below. Unless otherwise indicated, the estimated costs presented in this Plan are loaded and escalated.

¹ D.18-06-028 at 128, Ordering Paragraph 7. *See also id.* at 90-92.

² HCAs are defined in 49 CFR 192.903. Generally, an HCA is defined to include Class 3 and 4 locations, as well as any area in a Class 1 or 2 location where the potential impact radius is greater than 660 feet and the area within the potential impact radius includes 20 or more buildings intended for human occupancy or a site identified as occupied by 20 or more persons on at least 50 days in any twelve-month period.

TABLE 1
Line 1600 Test or Replace Alternative Designs Evaluated

Alternative Design	Loaded and Escalated Cost ³ (\$ millions)			Description
	Capital	O&M	Total	
Replace in HCAs/ Test in Non-HCAs ⁴	630	47	677	Replace pipeline in 14 replacement sections (<i>i.e.</i> , replace 37 miles primarily in HCAs with installation of ~43 miles of new, modern design, thicker 36-inch pipe); retrofit and hydrotest pipeline in 5 hydrotest sections; achieves compliance with Public Utilities Code section 958; enhances safety and extends lifespan of the pipeline by removing all vintage A.O. Smith flash-welded pipe in more populated areas; leaves vintage A.O. Smith flash-welded pipe in service in non-HCAs.
Full Hydrotest ⁵	92	233	325	Hydrotest entire pipeline in 22 sections, retrofit line to make fully piggable; achieves compliance with Public Utilities Code section 958 but leaves vintage A.O. Smith flash-welded pipe in service.
Full Replacement in Nearby Streets	778	-	778	Replace all vintage A.O. Smith flash-welded pipe (install ~56 miles of new, modern design, thicker 36-inch pipe); achieves maximum safety, reliability and operational enhancement and extends lifespan of the entire pipeline by abandoning or derating all vintage A.O. Smith flash-welded pipe; achieves compliance with Public Utilities Code section 958.
Full Replacement Along Highway 395	725	-	725	Replace all vintage A.O. Smith flash-welded pipe (install ~55 miles of new, modern design, thicker pipe); achieves maximum safety, reliability and operational enhancement and extends lifespan of entire pipeline by abandoning or derating all vintage A.O. Smith flash-welded pipe; achieves compliance with Public Utilities Code section 958; reduces costs and realizes construction efficiencies by installing replacement pipe in Old Highway 395.

³ Costs shown are loaded and escalated. Loaded costs are the sum of direct costs and indirect costs. Direct costs are costs for labor, material, services and other expenses incurred to design, engineer, plan, execute and document the Line 1600 testing and replacement work described in this document. This includes project development costs, project management, materials, construction, inspection, environmental and other project execution activities. Indirect costs are for Administrative & General, purchasing, warehousing, pension and benefits, payroll tax, and other costs that are overhead in nature. Allowance for Funds Used During Construction (AFUDC) and property taxes are not included in the costs presented for review in this Plan.

⁴ Identified as "Option 2" in D.18-06-028.

⁵ Identified as "Option 1" in D.18-06-028.

Each design alternative divides the scope of work into separate sections that can be completed independently to meet statutory and Commission directives to execute SDG&E and SoCalGas' Pipeline Safety Enhancement Plan (PSEP) as soon as practicable and manage potential impacts to customers. SDG&E and SoCalGas evaluated the design alternatives consistent with the requirements set forth in D.18-06-028, SDG&E and SoCalGas' approved PSEP Decision Tree, and the overarching objectives of PSEP to: (1) comply with the Commission's directives [subsequently codified in Public Utilities Code section 958]; (2) enhance public safety; (3) minimize customer impacts; and (4) maximize the cost effectiveness of safety investments.⁶ As required by D.18-06-028, SDG&E and SoCalGas coordinated with the Commission's Safety and Enforcement Division (SED) in developing and evaluating this Plan and alternative designs.

After carefully evaluating each alternative design and the Commission's direction in D.18-06-028, SDG&E and SoCalGas propose to replace approximately 37 miles of existing Line 1600 primarily located in HCAs and hydrotest the remaining approximately 13 miles of existing Line 1600 located in non-HCAs through execution of 19 separate project sections (Replace in HCAs/Test in Non-HCAs). A map of the proposed scope of work for the Plan is presented below in Figure 1. As summarized in Table 1 above, the estimated loaded and escalated cost of the proposed Plan, based on preliminary engineering, design and planning is approximately \$677 million. Of the total estimated cost, SDG&E and SoCalGas anticipate recording approximately \$630 million as a capital expenditure and approximately \$47 million as an operating expense.

⁶ Rulemaking (R.) 11-02-019, *Amended Testimony of Southern California Gas Company and San Diego Gas & Electric Company in Support of Proposed Natural Gas Pipeline Safety Enhancement Plan* (December 2, 2011) at 10.

LEGEND

- SECTION BREAKS
- NON-HCA
- PROPOSED REPLACEMENT
- PREVIOUSLY REPLACED
- HCA

SCALE

0 0.5 1.0 1.5 Miles

SDGE
San Diego Gas & Electric

SDGE
Transmission Positive Project

LINE 1600 REPLACE IN HCA/TEST IN NON-HCA ALTERNATIVE

SECTION 1
RAINBOW REPLACEMENT
3.68 MILES

SECTION 2
RICE CANYON RD HYDROTEST
3.24 MILES

SECTION 3
COUSER CANYON NORTH HYDROTEST
2.61 MILES

SECTION 4
COUSER CANYON SOUTH HYDROTEST
2.59 MILES

SECTION 5
LILAC RD REPLACEMENT
5.94 MILES

SECTION 6
MOOSA CREEK HYDROTEST
0.94 MILES

SECTION 7
DALEY RANCH HYDROTEST
3.50 MILES

SECTION 8
LA HONDA & LINCOLN REPLACEMENT
1.56 MILES

SECTION 9
MIDWAY DR REPLACEMENT
2.25 MILES

SECTION 10
BEAR VALLEY PKWY REPLACEMENT
3.71 MILES

SECTION 11
POMERADO RD NORTH REPLACEMENT
5.84 MILES

SECTION 12
POMERADO RD SOUTH REPLACEMENT
3.05 MILES

SECTION 13
SCRIPPS POWAY PKWY REPLACEMENT
2.97 MILES

SECTION 14
BLACK MT REPLACEMENT
4.53 MILES

SECTION 15
MCAS NORTH REPLACEMENT
1.27 MILES

SECTION 16
MCAS CENTRAL REPLACEMENT
1.30 MILES

SECTION 17
MCAS SOUTH REPLACEMENT
0.84 MILES

SECTION 18
KEARNY MESA REPLACEMENT
1.37 MILES

SECTION 19
SERRA MESA REPLACEMENT
4.27 MILES

⁷ Approximately 2.1 miles of vintage Line 1600 located within a non-HCA area within the Marine Corp Air Station (MCAS) Miramar is planned to be replaced to address airfield security, access and environmental concerns raised by MCAS Miramar.

field work will commence in the first quarter of 2020, with an initial focus on HCAs. Construction and testing activities are anticipated to span approximately four years. SDG&E and SoCalGas intend to present costs incurred for projects completed prior to 2022 for reasonableness review in a General Rate Case application and to include forecasts of testing and replacement costs for years 2022 and beyond in General Rate Case applications, consistent with D.16-08-003.

The Commission requires SDG&E and SoCalGas' Plan to include specific information as outlined in D.18-06-028 (at 90-92). SDG&E and SoCalGas' Plan complies with D.18-06-028 by providing the requisite information organized as follows:

TABLE 2
Plan Requirements Index

Plan Requirement	Location of Required Information in Report
Interim Safety Enhancement Measures	Section VI
Spike Test Best Practices	Section IV
Compliance with Applicable Regulations and Industry/Company Standards	Section IV
Maximum Test Pressure	Section IV
Prioritization List and Test/Replace Section Schedule	Section IV
Completion Timeline	Section IV
Test Section Prioritization Criteria	Section IV
Public Safety and Property/Environment Protection Measures	Section VI
Temporary Service Requirements (including location of temporary lateral pipelines if applicable)	Section IV
Cost Forecast (O&M and Capital) by Section and Year	Section VII
Test vs Replace Rationale for Each Section	Section IV

Plan Requirement	Location of Required Information in Report
Listing and GPS Coordinates of Existing Commercial and Residential Structures that abut the Easement (including potential encroachments)	Section VI
Identification of Potential Reroutes and/or Removal/Moving of Structures	Section IV

Introductory and background information in support of the proposed Plan is provided in Section II below. Throughout the development of this Plan, SDG&E and SoCalGas worked closely with SED, and those activities are described in Section III. In Section IV, SDG&E and SoCalGas describe the proposed Plan in greater detail, describing each individual project section, the prioritization process used to develop a construction schedule for each section, the routing criteria used to evaluate the alternatives considered in preparing the Plan, temporary service requirements to minimize service disruptions to customers during construction, and how implementation of the Plan is designed to meet or exceed current regulatory and industry standards. In Section V, a summary of technical considerations, including the attributes of Line 1600, its installation and assessment history, as well as the operating and maintenance history is provided. In Section VI, additional public safety and environmental protection measures, including interim safety enhancement measures, are described. In Section VII, SDG&E and SoCalGas present preliminary cost estimates for the proposed Plan and describe the methodology used to calculate them. In Section VIII, other alternative designs that were considered are discussed. SDG&E and SoCalGas address potential future Plan modifications in Section IX. Additional maps, illustrative materials, and other supporting information are provided in Section X as an Appendix.

II. BACKGROUND

A. Introduction

SDG&E and SoCalGas own and operate an integrated backbone natural gas transmission system consisting of pipelines, compressor stations, and underground storage facilities (Gas System). With their network of transmission pipelines and four interconnected underground storage facilities, SDG&E and SoCalGas deliver natural gas to a regional population of over 24 million energy consumers.

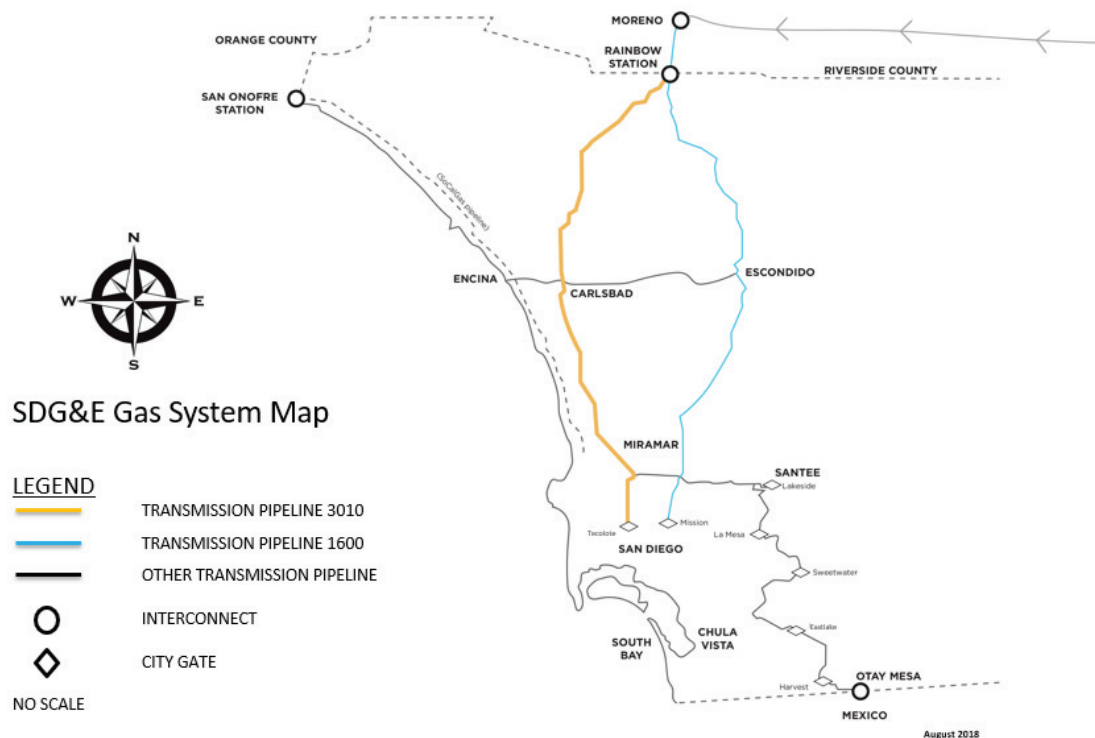
SDG&E's service territory for natural gas is the County of San Diego, which has a growing population of over 3.3 million, a \$200 billion economy, and home to the largest concentration of military assets and personnel in the world. Including its electric service territory in southern Orange County, SDG&E safely and reliably provides natural gas and electric service to approximately 3.6 million residential, commercial, and Electric Generation (EG) consumers, including the military, hospitals, universities and schools, through over 870,000 natural gas meters and 1.4 million electric meters.

Continuous enhancement of the safety of the natural gas transmission pipeline system through the execution of programs such as PSEP is an integral part of the safety culture at SDG&E and SoCalGas. As described above, two overarching objectives of PSEP are to enhance public safety and comply with the Commission's directives. This commitment to public and employee safety while complying with Commission orders and Public Utilities Code section 958 has not wavered.

B. The SDG&E Gas System

The SDG&E gas transmission system, which is part of SDG&E and SoCalGas' integrated natural gas system, is illustrated in Figure 2 below. The SDG&E gas transmission system consists primarily of two high-pressure, large-diameter pipelines that originate at Rainbow Station, located at the Riverside and San Diego County border, and extend south terminating within the core of the San Diego metropolitan area. The SDG&E system also has a receipt point at Otay Mesa which has historically only been used intermittently.

Figure 2: SDG&E Gas Transmission System



The SDG&E gas transmission system is designed to flow gas supplies from north to south, starting at the Riverside County line, and south to north, starting at the Mexican border, to meet consumer demand for heating homes on peak winter days, providing gas service to commercial and industrial operations, and to generate electricity to meet cooling demands on the hottest

days of summer. Gas supplies originating in the southwestern United States are transported on the SoCalGas system to San Diego first using a compressor station located in Moreno Valley, California known as the Moreno Compressor Station, and then using the two major transmission pipelines mentioned previously and described in more detail below.

Line 1600 is a 16-inch diameter natural gas transmission pipeline that runs from Rainbow Station in the north to Mission Station in the south. Line 1600's transmission function is important, not only for its contribution to system capacity, but also as a supply source for the portions of the gas distribution system that it directly feeds. Line 1600 also contributes to gas transmission system reliability should other elements of the system be out of service or require pressure reduction. While Line 1600 tends to contribute 65 million cubic feet per day (MMcfd) to the SDG&E system capacity with Line 3010 in service, Line 1600 could supply 115 MMcfd at a Maximum Allowable Operating Pressure (MAOP) of 512 pounds per square inch gauge (psig), 150 MMcfd at an MAOP of 640 psig, or 160 MMcfd at an MAOP of 800 psig, if Line 3010 were out of service.

Line 1600 works in conjunction with another north-to-south running pipeline, Line 3010, a 30-inch diameter transmission pipeline running from the Rainbow Station to the Tecolote Station. Line 3010 was placed into service in 1961 and provides approximately 90 percent of SDG&E's capacity, assuming compression is available. Line 3010 and Line 1600 also interconnect via transmission cross-tie pipelines between Oceanside and Escondido and between Miramar and Santee.

In addition to Lines 3010 and 1600, the third major component of the SDG&E system bringing gas from the north is the Moreno Compressor Station. The Moreno Compressor Station

is located in the SoCalGas service territory approximately 35 miles north of the San Diego County line in Moreno Valley in Riverside County. Essentially, all gas supplies that come into San Diego County from the north pass through the Moreno Compressor Station. This is a critical facility in meeting gas supply requirements for SDG&E.

C. Overview of Line 1600

Line 1600 operates as a transmission pipeline, supplies approximately 10% of the natural gas volumetric demand in San Diego County and serves as the sole or primary supply of natural gas for customers in the inland valley communities of Rainbow, eastern Fallbrook, Valley Center, Escondido, Rancho Bernardo, Rancho Peñasquitos, Poway, Scripps Ranch, Kearny Mesa, and Serra Mesa. These communities represent about 17% (~150,000) of San Diego's customers who depend on Line 1600 for reliable natural gas supply.

Currently, Line 1600 has a Maximum Operating Pressure (MOP) and MAOP of 512 psig along its entire 50-mile length. Line 1600 distributes gas to customers along its length via approximately 60 pipeline interconnections that feed local gas distribution systems or directly feed customers at high pressure meter sets.

The distribution supply line systems (defined as greater than 60 psig) depend on Line 1600 for a steady supply of high pressure natural gas to support the local demands downstream. Each of the distribution supply systems has been designed, sized, and planned to reliably serve customer peak demand based on existing, as well as anticipated, system growth in the areas they serve. As considered in this Plan, the "Line 1600 corridor" constitutes those areas served by the natural gas distribution system along the 50-mile length of Line 1600, where Line 1600

supplies significant amounts of natural gas to those areas. The Line 1600 corridor is generally represented by the area displayed in the map included in Section X, Appendix, Figure 10.

A foremost consideration in conjunction with replacing and testing Line 1600 is that Line 1600 is the primary, and in many cases, the only natural gas supply source for the local gas distribution systems that serve well over 100,000 customers along the Line 1600 corridor. Given that there are no other supply sources, any work identified for Line 1600 requires significant efforts and must be carefully planned to avoid customer service interruptions. The pipeline infrastructure required to be installed to replace Line 1600 must be interconnected to the existing gas distribution system at select locations to ensure that pipeline capacity, and therefore reliability of service to customers, is not compromised. This will require modifications to the gas distribution system to interconnect new supply sources to portions of Line 1600, and these interconnections will require some new distribution pipeline extensions as well as new pressure regulator stations and “tie-overs” that connect the new infrastructure to the remaining existing infrastructure.

III. COORDINATION WITH THE COMMISSION’S SAFETY AND ENFORCEMENT DIVISION

In D.18-06-028, the Commission directs SDG&E and SoCalGas to coordinate with SED on the future treatment of existing Line 1600. Specifically, the Decision requires:

- The Director of the Safety and Enforcement Division, or designee, is delegated the following authority to:
 - a) Review all activities of any kind related to the hydrotesting of Line 1600;
 - b) Inspect, inquire, review, examine and participate in all activities related to Line 1600;
 - c) Order San Diego Gas & Electric and Southern California Gas Company to take any actions necessary to protect public safety. (OP15)

- The Applicants shall work with SED to prepare the Plan. (p. 91)
- Applicants shall work with SED to determine:
 - a) The maximum test pressure commensurate with the MAOP deemed safe for Line 1600; and
 - b) A prioritization list and schedule for testing of sections. (p. 91)

In compliance with the Decision's directives, SDG&E and SoCalGas coordinated with SED throughout the development of this Plan. Between the Decision date of June 21, 2018 and the Plan submission date of September 26, 2018, SDG&E and SoCalGas met with SED both telephonically and in person more than six times and facilitated an on-site examination by SED staff of the existing Line 1600 easements and several identified locations for replacement sections in nearby streets.

During these coordination meetings, SED emphasized that it is SDG&E and SoCalGas' responsibility, as the system operator, to make determinations about which sections to replace and which to test, considering the best interest of safety related to existing Line 1600, as well as aspects of any re-route of the replacement sections. SED advised SDG&E and SoCalGas to include all issues and factors that influence decisions to replace or test sections of Line 1600 in the Plan.

Throughout the three-month coordination period, SDG&E and SoCalGas frequently shared Plan development objectives, challenges and proposed treatment of section projects with SED, and received ongoing feedback and guidance from SED to inform the development of this final Plan. SDG&E and SoCalGas have incorporated SED's input from the three-month coordination into this proposed Plan.

IV. PROPOSED TEST AND REPLACEMENT PLAN FOR LINE 1600

A. Scope

Through this test and replacement Plan, SDG&E and SoCalGas propose to replace approximately 37 miles of existing Line 1600 located in HCAs and through secured federal lands,⁸ and pressure test approximately 13 miles of existing Line 1600 located in non-HCAs. The proposed scope of work is divided into 19 sections, each of which has independent utility and can be constructed separately to enable SDG&E and SoCalGas to minimize customer and community impacts and meet the Commission's directive to execute PSEP as soon as practicable.⁹ The initial focus will be on the HCA sections. The following sections provide additional information supporting the proposed Plan.

The proposed Plan is the result of following the PSEP Decision Tree analysis and applying sound judgment and working knowledge of Line 1600 and the San Diego natural gas transmission and distribution systems. It identifies the work required to complete the replacement and testing of Line 1600 while maintaining gas supply to the current customer base. The overarching objectives of this Plan are consistent with the overarching objectives of PSEP: (1) comply with the Commission's directives [subsequently codified in Public Utilities Code section 958]; (2) enhance public safety; (3) minimize customer impacts; and (4) maximize the cost effectiveness of safety investments.¹⁰

⁸ Approximately 2.1 miles of vintage Line 1600 located within a non-HCA area within MCAS Miramar is also planned to be replaced to address airfield security, access, and environmental concerns raised by MCAS Miramar.

⁹ D.11-06-017 at 19.

¹⁰ R.11-02-019, *Amended Testimony of Southern California Gas Company and San Diego Gas & Electric Company in Support of Proposed Natural Gas Pipeline Safety Enhancement Plan* (December 2, 2011) at 10.

B. SDG&E and SoCalGas Considered Testing or Replacement Alternatives Consistent with the Approved PSEP Decision Tree and the Commission's Directives in D.18-06-028.

As indicated above, SDG&E and SoCalGas evaluated four test or replacement alternatives in preparing the proposed Plan. The four alternatives evaluated by SDG&E and SoCalGas are rooted in the approved PSEP Phase 1 Decision Tree process, which guides the determination of whether a pipeline should be tested or replaced. The PSEP Phase 1 Decision Tree was approved by the Commission in D.14-06-007¹¹ and represents SDG&E and SoCalGas' analytical approach to testing or replacing pipelines to enhance the safety of their integrated natural gas transmission system. SDG&E and SoCalGas use the Decision Tree and its concepts to guide their decision-making process, and ultimately apply professional judgment, as knowledgeable operators of their system, to determine what is prudent, best achieves safety enhancement objectives, and maximizes the cost effectiveness of customers' safety investments. Relevant considerations include costs associated with pressure testing, including managing customer impacts, costs of replacing the existing pipeline, and other engineering factors, depending on the unique conditions and circumstances of each pipeline project.

SDG&E and SoCalGas apply the following guiding principles to complete this PSEP test versus replacement analysis: (1) SDG&E and SoCalGas will not interrupt service to core customers in order to pressure test a pipeline; (2) SDG&E and SoCalGas will work with noncore customers to determine if an extended outage is possible; (3) SDG&E and SoCalGas will, where necessary, temporarily interrupt noncore customers as provided for in their tariffs; (4) SDG&E and SoCalGas will work with noncore customers to plan, where possible, service interruptions

¹¹ D.14-06-007 at 59, Ordering Paragraph 1.

during scheduled maintenance, down time or off-peak seasons; and (5) SDG&E and SoCalGas will consider cost and engineering factors along with the improvement of the pipeline asset. These principles were explained in SDG&E and SoCalGas' amended PSEP and at hearings in A.11-11-002. It is important to note that no industry-wide standard exists that balances the risk of a pipeline failure with the cost of testing or replacing such pipeline. SDG&E and SoCalGas are in the best position to make this determination on a project-by-project basis, based on the unique characteristics and circumstances of each pipeline, applying their engineering expertise and knowledge of the pipelines they operate.

Applying the Commission-approved Decision Tree and professional judgment, and the limitations imposed by the Commission in D.18-06-023, SDG&E and SoCalGas determined that replacing vintage Line 1600 pipe in current and anticipated HCAs and pressure testing in non-HCAs is reasonable, enhances public safety, and complies with Commission and statutory requirements and benefits customers. Having evaluated the characteristics of Line 1600 and the environment in which it operates, SDG&E and SoCalGas propose to replace sections of Line 1600 in HCAs because this allows the greatest opportunity to significantly improve safety in populated areas by eliminating known flaws associated with the A.O. Smith electric flash welded (EFW) pipe and incorporate new, significant safety features (*e.g.*, modern manufacturing methods, heavier wall thickness, improved grade with better fracture control, and installation of modern safety features, such as warning mesh above the pipeline to alert excavators they are near the pipeline). These safety improvements could not be achieved through hydrotesting alone. Moreover, replacing 1949-vintage pipeline in the HCA sections of Line 1600 avoids the significant costs associated with hydrotesting the entire existing line (including any repairs

identified during hydrotesting), the costs to retrofit Line 1600 to accommodate in-line inspection tools, and additional costs to replace those sections of the nearly 70-year-old Line 1600 in the future. In addition, ongoing operations and maintenance costs for the new sections of pipeline are anticipated to be lower than historical costs.

This Plan assumes that all customers who currently have natural gas service will continue to have the same level of service after Line 1600 is replaced/tested. The enhancements included as part of the Plan are intended to avoid existing customers experiencing a reduction in reliability, capacity, or pressure compared to what they have historically experienced. The final design of improvements will incorporate good engineering judgment related to gas transmission and distribution system reliability and capacity and should allow for reasonable long-term future operating conditions.

Engineering factors associated with the vintage A.O. Smith EFW pipe that influence pipeline safety, especially in populated areas, are the primary driver for the proposed replacement of sections of Line 1600 in HCAs. The approach set forth in this proposed Plan recognizes the additional value of the installation of new pipeline sections in densely populated areas, including enhancement of the overall safety and reliability of the pipeline, because new pipe is manufactured to modern standards and has physical characteristics that enhance safety as compared to the earlier vintage pipelines. This is consistent with PSEP and Commission General Order (GO) 112-F, which requires escalating margins of safety as population density increases.

The scope of work required to replace/test Line 1600 includes new transmission main, some new supply lines and new distribution mains, and new or rebuilt pressure regulating

stations that must be connected to the modified system. Also included in this analysis is the abandonment of existing infrastructure, including pressure regulator stations that would no longer be needed.

Testing work includes the work necessary to perform the test, including a spike test, and keep existing customers in service while this work is performed. Test section preparation work also includes removal of wrinkle bends as well as shorter radius bends and other features which prevent in-line-inspections of the legacy pipeline using commercially available circumferential magnetic flux leakage (CMFL) smart pigging tools.

The proposed Plan is a prudent approach to achieving compliance with the directives of the Commission and Public Utilities Code section 958. Factors such as potential environmental impacts, impacts to private property, potential growth, project costs, and feasibility were considered as part of determining replacement routes for each project section. As SDG&E and SoCalGas transition from high-level planning to detailed design, engineering and planning, additional analysis will be completed, and some refinement and modification of the Plan may be necessary to address engineering, permitting, community, or cost considerations.

C. Descriptions of Each Pressure Test or Replacement Project Section

The proposed test and replacement Plan for Line 1600 is comprised of 19 project sections. The sections have been numbered from north to south as shown on Figure 1 above. To provide additional descriptive reference, each project section has been assigned a name that corresponds to a geographic reference and also describes whether the section is planned to be replaced or hydrotested. These names are also reflected in Figure 1 above. Each of these sections is further described in Table 3 below, which summarizes key factors considered in

planning the scope of work for each section. Unique factors associated with each section can influence hydrotest break points, section boundaries, schedule, and other key project attributes.

TABLE 3
Descriptions of Each Test or Replace Project Section and Estimated In-Service Dates

Section Number	Section Name	HCA	Approx. Mileage	Description	Estimated In-Service Date
1	Rainbow Replacement	Yes	3.7	Section starts at Rainbow Station (beginning of line) and will tie into existing line about 2,000 feet past non-HCA alignment due to easier access to land and more level laydown area for water tanks. The south point also serves as a breaking point due to tap to a power plant which will minimize impact.	Q4 2022
2	Rice Canyon Hydrotest	No	3.2	Section starts after Rainbow Replacement section and ends at Main Line Valve (MLV) 1601 due to valve isolation point and adjacent laydown yard a couple feet from MLV.	Q1 2024
3	Couser Canyon North Hydrotest	No	2.6	Section begins after MLV 1601 and ends at Pala Loma Dr., the midpoint of increasing elevation.	Q2 2024
4	Couser Canyon South Hydrotest	No	2.6	Section starts at Pala Loma Dr. and goes southbound until reaching Keyes Creek Rd. Keyes Creek Road is a little over 2,000 feet north of the start of the HCA section (Lilac Rd. Replacement). Keyes Creek Rd. was selected as the break point because it provides adequate level work space for hydrotest equipment and working area. Utilizing Keyes Creek Rd. location also minimizes environmental impacts.	Q3 2024
5	Lilac Rd Replacement	Yes	5.9	Section starts at Keyes Creek Rd. and ends south of Betsworth Rd., where non-HCA segment starts. Southern break sits on private property, which is planned to be used as a laydown yard.	Q1 2023

Section Number	Section Name	HCA	Approx. Mileage	Description	Estimated In-Service Date
6	Moosa Creek Hydrotest	No	0.9	Section starts at the beginning of non-HCA near Betsworth Rd. and runs south until break point at Mirar De Valle Rd. Mirar De Valle Rd. is used as a breaking point because it is the mid-point of rising elevation with the adjacent hydrotest and has a yard within a couple feet from the line.	Q2 2023
7	Daley Ranch Hydrotest	No	3.5	Section starts at Mirar De Valle Rd. and ends about 1,000 feet north of MLV 1604 where HCA starts.	Q2 2023
8	La Honda & Lincoln Replacement	Yes	1.6	Section starts about 1,000 feet north of MLV 1604 where HCA starts and ends at the crossing of Lincoln Ave. & Midway Dr. due to gas handling purposes.	Q2 2022
9	Midway Dr Replacement	Yes	2.2	Section starts at the crossing of Lincoln Ave. & Midway Dr., runs south of Midway Dr. and ends north of Birch Ave. due to tie in to previously-tested pipe and close to laydown yards.	Q3 2020
10	Bear Valley Pkwy Replacement	Yes	3.7	Section starts north of San Pasqual Valley Rd. where previously replaced pipe ends and HCA starts. Section runs south of Bear Valley Pkwy. and ends at Mule Hill where it meets previously tested pipe. Replacement route resolves narrow 20-foot ROW issues near homes and sensitive habitat by placing pipeline in major roadway.	Q3 2021
11	Pomerado Rd North Replacement	Yes	5.8	Section starts at MLV 1606 near Highland Valley Rd. and runs south along Pomerado Rd., ending at Ted Williams Pkwy. Ted Williams Pkwy. is used as a break point because it is the midpoint of the entire Pomerado Rd. replacement and is close to a laydown yard. Scope of work removes the pipe from close proximity to commercial and residential structures in the Rancho Bernardo, Carmel Mountain Ranch and Rancho Peñasquitos communities.	Q4 2021

Section Number	Section Name	HCA	Approx. Mileage	Description	Estimated In-Service Date
12	Pomerado Rd South Replacement	Yes	3.1	Section starts at Ted Williams Pkwy. and runs south in large four-lane streets using Pomerado Rd. and Scripps Poway Pkwy. Break point was selected due to large available roadways and having a potential laydown yard at the south end of the section. Section routing does not traverse sensitive habitat associated with Peñasquitos Creek and removes the pipe from close proximity to commercial and residential structures in the Carmel Mountain Ranch and Rancho Peñasquitos communities.	Q1 2022
13	Scripps Poway Pkwy Replacement	Yes	3.0	Section starts at the intersection of Pomerado Rd. and Scripps Poway Pkwy. and runs along Scripps Poway Pkwy and remains inside Miramar Ranch North neighborhood until reaching 15 Freeway. The section ends near 15 Freeway due to proximity to a potential laydown yard within Miramar Ranch North neighborhood.	Q1 2022
14	Black Mountain Replacement	Yes	4.5	Section starts near intersection of Scripps Poway Pkwy. and 15 Freeway, runs south on Black Mountain Rd. until reaching Miramar Rd. This route was selected to remain inside the Miramar neighborhood to interconnect feeds to existing distribution system, and to relocate pipe away from close proximity to existing commercial and residential structures.	Q4 2020
15	MCAS North Replacement	Yes	1.3	Section starts at the intersection of Miramar Rd. and Kearny Villa Rd. and runs south on Kearny Villa Rd. until reaching Miramar Way at the location of the tap that feeds MCAS Miramar.	Q3 2023

Section Number	Section Name	HCA	Approx. Mileage	Description	Estimated In-Service Date
16	MCAS Central Replacement	No	1.3	<p>Section starts on MCAS Miramar near Miramar Way and extends southward along Kearny Villa Rd. to the Kearny Pressure Limiting Station. Section ties into existing previously tested pipe that crosses under Highway 163. Although this section is not within HCA, this section is a replacement section due to limitations in the current alignment. The current alignment crosses through MCAS Miramar base and the current easement is set to expire in 2022. Replacement provides a new easement in a public road, is compatible with base operations as it removes Line 1600 from within the high security area, and avoids environmentally-sensitive areas along existing ROW. MCAS Miramar sent a letter to SDG&E stating their concerns with hydrotesting within the secured base perimeter and their preference for replacement in the public Kearny Villa Road.¹²</p>	Q3 2023
17	MCAS South Replacement	No	0.8	<p>Section starts at the Kearny Villa Pressure Limiting station cross tie and continues south in Kearny Villa Rd. to Highway 52, where it ties into previously tested pipe that crosses under Highway 52. Although this section is not within HCA, this section is identified for replacement due to limitations in the current alignment. The current alignment crosses through MCAS Miramar base across environmentally sensitive areas. Installing a replacement section at this location significantly reduces downstream customer service impacts compared to hydrotesting. Because of these factors, along with access issues to the existing ROW, SDG&E and SoCalGas propose to replace the line within the adjacent street ROW.</p>	Q4 2023

¹² MCAS, Miramar letter from Colonel C. B. Dockery, Commanding Officer of MCAS Miramar, dated September 5, 2018.

Section Number	Section Name	HCA	Approx. Mileage	Description	Estimated In-Service Date
18	Kearny Mesa Replacement	Yes	1.4	Section starts south of 52 Freeway near the intersection of Ruffin Rd. and Kearny Villa Rd. New replacement reconnects to previously-tested pipe at Chesapeake Dr. and continues again at the intersection of Overland Ave. and Farnham St., where HCA section starts. Replacement runs south of Overland Ave., Spectrum Center Blvd., and Ruffin Rd., until reaching Ridgehaven Ct. Section is split at this intersection due to the need to maintain service to a large industrial customer.	Q1 2021
19	Serra Mesa Replacement	Yes	4.4	Section begins near the intersection of Ridgehaven Ct. and Ruffin Rd. Alignment runs through Ruffin Rd., Aero Dr., Sandrook Rd., Murray Ridge Rd., and Sandmark Ave., until reaching the terminus of L1600 at Mission Station.	Q1 2021

D. Section Schedule/Prioritization

The proposed Plan is comprised of groupings of 19 independent project sections that can be completed independently to efficiently address safety, operational, community, environmental, constructability, and cost considerations associated with each distinct portion of Line 1600. The scope of work consists of 14 replacement sections and five hydrotests. For the hydrotest work, four of the tests will be grouped into adjacent pairs that will be managed together, resulting in a total of three hydrotest projects. If added together, the total length of new 42-inch diameter pipe to be installed is approximately 42.6 miles. Cumulatively, the total length of existing Line 1600 to be hydrotested is approximately 12.9 miles. Maps showing details of the proposed scope of work are presented in the Appendix.

The 19 sections are prioritized and scheduled so as to achieve the greatest safety enhancement benefits and complete the replacement and testing of Line 1600, with an initial

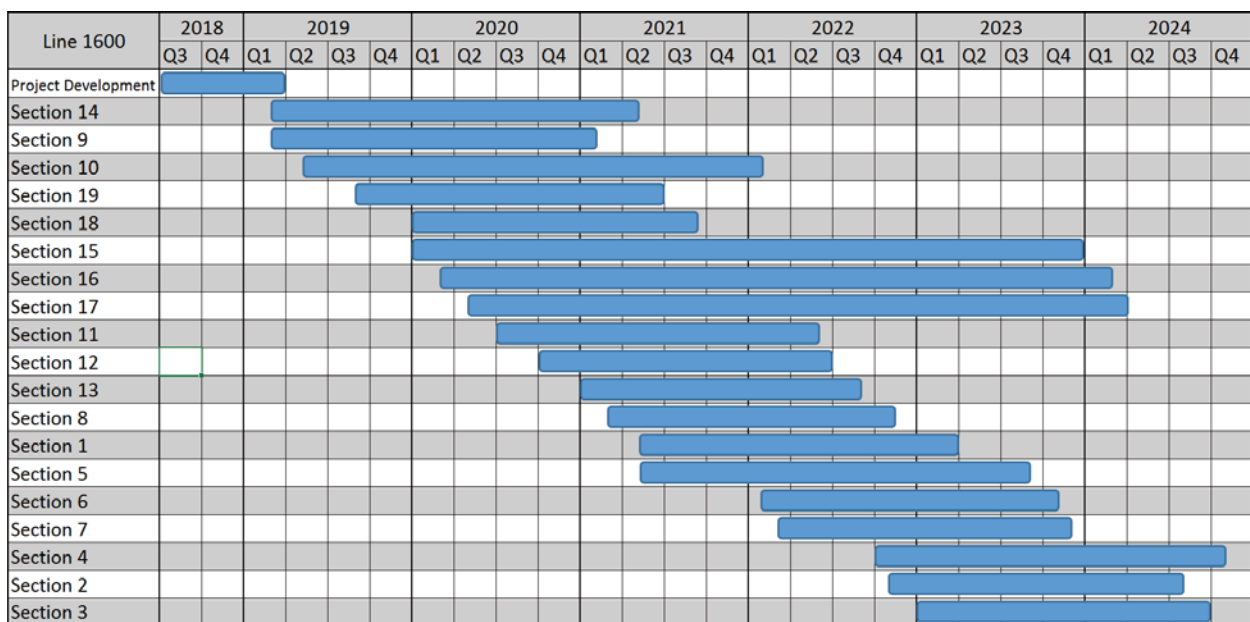
focus on HCAs, as soon as practicable. Many factors were considered while scheduling the projects, including customer impacts, permit lead time, land rights lead time, potential environmental impacts, outreach activities, and operational limitations. Generally, sections from the City of Escondido south to the terminus of Line 1600 at Mission Gate Station are prioritized first as this corridor represents the highest concentration of population immediately adjacent to existing Line 1600 and therefore stands to achieve the biggest relative safety benefit.

Additionally, the majority of the route for replacement pipeline sections falls within existing streets, which is anticipated to minimize permitting time. The construction schedule presented in this Plan will enable SDG&E and SoCalGas to bring Line 1600 into compliance with the requirements of Public Utilities Code section 958 “as soon as practicable,” and prioritizes project sections to achieve the greatest safety enhancement in areas with the highest concentrations of people and property.

To facilitate isolating Line 1600 for hydrotesting or connecting sections of replacement pipeline during the winter months when core customer gas use is highest, it may be necessary to schedule gas to be delivered at the Otay Mesa receipt point. During summer months, sections of Line 1600 north of where it meets Line 1601 in Escondido cannot be isolated due to high peak loads on peaker plants in the area; supply delivered at the Otay Mesa receipt point cannot mitigate this concern during summer periods due to pipeline capacity limitations. Because the hydrotest sections are located north of Escondido, this is a main driver for scheduling the hydrotest sections. Several project sections are located within jurisdictions that are anticipated to require long-lead permits or land acquisitions. For scheduling purposes, some projects will require effort early on to begin a potential lengthy permit and/or land rights acquisition process

and which will lead the project to be constructed in the latter years of the proposed timeline. For example, there are some potential long-lead land acquisitions needed from local municipality-owned, State-owned and Federal-owned lands. There are also some potentially long-lead time permits that may be required. For example, a project within an environmentally-sensitive area may require an incidental take permit due to the potential for an endangered and/or listed species occurring within the proposed construction work areas. The acquisition of these permits may take one-to-two years of field work, environmental documents preparation and negotiations with agencies before a permit is granted to the utilities. Given the size, scope and complexity of the project, SDG&E and SoCalGas assume extensive community and customer outreach activities will be necessary to achieve the schedule and timeline set forth in this Plan. Figure 3 below shows the preliminary schedule, which may be revised as SDG&E and SoCalGas complete the detailed engineering, design and planning process, for all 19 sections.

Figure 3: Plan Schedule



E. Routing Criteria

As described above, the overarching objectives of PSEP are to: (1) comply with the Commission's directives [subsequently codified in Public Utilities Code section 958]; (2) enhance public safety; (3) minimize customer impacts; and (4) maximize the cost effectiveness of safety investments. Consistent with these overarching objectives and the requirements set forth in D.18-06-028, SDG&E and SoCalGas' Plan considers the following factors to address Line 1600 as soon as practicable, execute the Plan through efficient use of resources, and minimize potential impacts to customers and communities. These factors are incorporated in the proposed routing criteria utilized to evaluate alternatives and ultimately to develop the final Plan.

- Follow generally accepted principles for siting infrastructure.
- Avoid unnecessary impacts to the environment.
- Avoid unnecessary acquisition of private property.
- Allow for safe and efficient construction and testing activities.
- Provide all-weather accessibility for operations, maintenance, and emergency response.
- Allow replacement pipelines to integrate into the existing natural gas pipeline infrastructure serving customers along the existing Line 1600 corridor.
- Avoid impacts to critical operations at MCAS Miramar.
- Meet current and near-term energy needs in a cost-effective and efficient manner.

Of the approximately 43 miles of new pipeline planned for installation as part of the replacement scope of work outlined in this Plan, approximately 41 miles will be routed in nearby streets, minimizing potential impacts to environmentally sensitive areas and private property, consistent with SDG&E and SoCalGas' routing criteria. Where possible, the replacement pipeline will be installed in larger multi-lane streets that are most suitable for larger-scale utility

infrastructure. This allows for safe and efficient construction and future inspections and maintenance of the pipeline to be completed with minimal disruption to the community. Construction in existing roadways typically limits environmental impacts, as the work area is paved over and has been previously disturbed. Placing the pipeline in existing roadways also avoids the need to acquire private property, which can be time-consuming and costly if property owners are not interested in selling and eminent domain is required. Photographs representative of the streets proposed for replacement construction are provided in the Appendix.

In the evaluation of alternative designs, SDG&E and SoCalGas considered the reasonableness of potentially constructing replacement pipe in existing 20-foot-wide Line 1600 easements. SDG&E and SoCalGas concluded it is not feasible, prudent nor reasonable to build a new replacement pipeline entirely within the existing Line 1600 rights-of-way. Accordingly, the Plan calls for the relocation of replacement pipeline sections to nearby public roadways, as appropriate. Adequate space for new construction (40-50 feet to 50-100 feet) does not generally exist along the Line 1600 centerline because the area surrounding the existing 20-foot-wide rights-of-way has been heavily developed in many locations since the line was originally constructed in 1949. Photographs that illustrate the development that has occurred along the existing rights-of-way are presented in the Appendix.

In most locations, constructing in the existing right-of-way would be very difficult and would potentially have a large impact on the community and the environment due to the need to obtain additional right-of-way to perform construction safely. To complete construction in a reasonably safe and efficient manner, as mentioned above, a minimum of 40-to-50 feet, and in

some areas, between 50 and 100 feet, of clear right-of-way is normally required. Construction would be complicated, and there would be additional risk and safety complexity, and extensive heavy equipment operations in close proximity to the existing 16-inch diameter pipeline.

The costs to acquire additional rights-of-way necessary to safely and efficiently complete construction are anticipated to be significant and could require SDG&E and SoCalGas to invoke the eminent domain process. When this concept was studied as part of developing the proposal for SDG&E and SoCalGas' Pipeline Safety & Reliability Project (PSRP) Application (A.15-09-013), it was determined that approximately 500 parcels are located within 35 feet of the existing rights-of-way. Approximately 125 residences, 24 commercial buildings, and seven apartment buildings are anticipated to possibly require acquisition for construction of a new pipeline within the Line 1600 rights-of-way. The effort and cost of expanding the existing rights-of-way for pipeline replacement construction is anticipated to be considerable, as well as disruptive to the property owners and tenants. In addition, by law, the success of an eminent domain action is determined by balancing various factors, including whether the property is necessary for the public project for which it is condemned. Existing roadways would not pose these challenges and costs, as SDG&E has existing franchise rights that permit installation of pipeline in streets and disruption would be limited.

In preparing this Plan, SDG&E and SoCalGas sought input from two reputable gas pipeline contractors with experience working in southern California regarding constructability of different alternatives, including attempting to construct replacement pipeline sections within Line 1600's existing 20-foot rights-of-way. Both contractors noted the challenges of potentially constructing in the existing rights-of-way and the impacts to productivity. Both noted that construction in

nearby roads would be more efficient. Copies of letters provided to SDG&E and SoCalGas from these contractors are provided in the Appendix.

Because of the identified constraints, construction of replacement sections of pipeline entirely within the existing Line 1600 rights-of-way would not be consistent with the routing criteria described in this Plan and would be infeasible from a constructability, environmental, social, economic, and site-suitability perspective. As such, SDG&E and SoCalGas determined the most suitable and preferred location for the majority of the replacement pipe is in existing nearby streets.

F. Temporary Service Requirements

To maintain uninterrupted gas supply to customers during replacement/hydrotest of the pipeline, customers may be temporally fed using compressed natural gas (CNG), liquefied natural gas (LNG) or through construction of a bypass pipeline. The equipment required varies by the volume consumed by each customer. SDG&E's Distribution Region Engineering organization, along with SoCalGas' Gas Control & System Planning organization, evaluated the pipeline and identified the customers that would require isolation and alternate gas supply during replacement/hydrotesting activities. After analyzing the needs of and potential service impacts to customers, SDG&E and SoCalGas identified the equipment required to maintain service during construction. The types of equipment identified include CNG pods, medium and large CNG trucks and bypass installations. Isolation of customers is accomplished using stopples and temporary and permanent bypasses. The estimates presented in this Plan include estimated costs for a hook-up at each site and a temporary alternative gas supply cost, based on the type of equipment required.

G. Compliance with Applicable Regulations and Industry/Company Standards

All testing or replacement projects implemented under this Plan will be subject to robust guidelines and oversight to comply with SDG&E and SoCalGas' internal standards and applicable laws and regulations. These applicable regulations include the Code of Federal Regulations, Title 49, Part 192, (49 CFR 192), which provides requirements for Materials (Subpart B), Pipe Design (Subpart C), Design of Pipeline Components (Subpart D), Welding of Steel in Pipelines (Subpart E), General Construction Requirements for Transmission Lines and Mains (Subpart G), and Test Requirements (Subpart J). In addition to its specific requirements, the Federal Code also "incorporates by reference" the requirements of industry standards such as the American Society for Mechanical Engineers (ASME), American National Standards Institute (ANSI), American Petroleum Institute (API) and American Society for Testing and Materials (ASMT). These industry standards provide methodologies and calculations for more specific and technical requirements addressed in the code. In addition, Commission GO 112-F provides additional requirements with respect to the design, construction, testing, maintenance, and operation of utility gas gathering, transmission and distribution piping systems.

SDG&E and SoCalGas' internal standards have been developed to address applicable laws and regulations and contain references to the regulations that are addressed. These internal standards are reviewed both on a periodic basis and ad-hoc basis as regulations are changed and updated. For each project, internal standards and practices are employed to govern the design analysis, materials purchased, and construction practices.

SDG&E and SoCalGas' Gas Standards are driven by a dual objective: complying with applicable laws and regulations and promoting safety and operational efficiency. The Gas

Standards are the policies and documents that demonstrate compliance with applicable state and federal requirements. The Commission's SED regularly reviews the natural gas transmission and distribution functions for each utility providing natural gas in the state. The Commission compares the functions of transmission and distribution with requirements set forth in GO 112-F as well as federal standards. Through these reviews, SED is able to evaluate and provide input on the sufficiency of the Gas Standards in complying with GO 112-F and the referenced provisions of Title 49 of the Code of Federal Regulations (49 CFR).

Additionally, the Gas Standards are regularly reviewed and updated by SDG&E and SoCalGas personnel and contractors¹³ to promote both compliance with laws and regulations and to reflect industry standards and SDG&E and SoCalGas' best practices.¹⁴ These Gas Standards form the foundation for SDG&E and SoCalGas' PSEP standards and practices.

The Plan will, at a minimum, meet applicable federal and state safety regulations, rules, and requirements by complying with applicable SDG&E and SoCalGas Gas Standards, and will, in many cases, exceed these requirements. SDG&E and SoCalGas' Gas Standards comprise the policy and procedures that govern the design, construction, operations, and maintenance of the Transmission and Distribution systems and are based on the relevant regulatory codes and ordinances. Although the Gas Standards themselves may exceed federal and state safety

¹³ For example, when PSEP was first initiated, PSEP contractors reviewed policies, procedures, technical specifications and work instructions. This review was done to incorporate, where possible, improvements and content enhancements.

¹⁴ When unique situations require additional Gas Engineering guidance, PSEP seeks out the assigned Gas Standard "owner" for solutions. A gas standard owner is the subject matter expert responsible for updating standards for compliance with applicable codes. For example, when situations require an exception to an applicable Gas Standard, the appropriate Gas Standard owner is consulted and, if the exception is an acceptable accommodation, the Gas Standard owner documents his/her approval.

regulations, rules, and requirements, for this Plan, SDG&E and SoCalGas identify additional areas where they propose to exceed federal and state safety regulations, rules, and requirements. Section D of the Appendix provides a summary of where the execution of the proposed Plan is anticipated to exceed applicable state and federal safety regulations, rules, and requirements, including those set forth in GO 112-F, CFR Parts 191 and 192, and the California Occupational Safety and Health Act (Cal/OSHA).

In addition to the summary provided in Section D of the Appendix, SDG&E and SoCalGas provide the following supplemental explanation regarding the applicable Code¹⁵ requirements the proposed Plan is anticipated to meet or exceed.

1. SDG&E and SoCalGas Design Standards and Practices

SDG&E and SoCalGas' design standards and practices address materials to be used and proper design in accordance with GO 112-F and applicable federal laws and regulations. These design standards and practices enable: (1) development of specific engineering requirements for materials used in strength test or replacement projects; (2) preparation of designs that comply with applicable laws, permits, SDG&E/SoCalGas, and industry standards; (3) utilization of applicable engineering and design standards developed for strength testing or replacement projects; and (4) implementation of consistent design and material requirements for the various engineering design firms contracted to assist with design development. While many industry

¹⁵ As used in this Plan, "Code" refers to 49 CFR Part 192, which governs nearly all aspects of the design, inspection, and testing of a pipeline and its appurtenances.

standards are incorporated by reference in the Gas Standards,¹⁶ the industry standards generally applied when designing facilities are summarized in Table 4 below.

TABLE 4
Summary of Applicable Industry Design Standards

Steel Line Pipe	API 5L
Steel Line Pipe Grade B	ASTM A 106
Valves	API 6D
High Yield Weld Fittings	Manufacturers Standardization Society (MSS) SP 75
Grade B Weld Fittings	ASTM A234
Flanges	ANSI B16.5
Forged Steel Weld Fittings	ASTM A105
Pressure Vessels	ASME VIII
Welding	API 1104
Cathodic Protection	National Association of Corrosion Engineers (NACE) RP-0169
AC Mitigation	NACE RP-0177
National Electric Code	National Fire Protection Association (NFPA) 70

The design specifications, testing requirements and testing results are documented and retained for the life of the asset to demonstrate compliance, and support the operation, maintenance, and design level of each new section of pipeline intended to operate at a pressure greater than 100 psig.

2. Spike Test Best Practices: SDG&E Gas Standards G7361, G7365, G7369

Under existing SDG&E Gas Standards, absent an applicable exception, hydrotests of new and existing pipeline sections require a 5% spike for 30 minutes at the beginning of the test, such

¹⁶ For example, designs are also reviewed for conformance with ANSI B31.8, “Gas Transmission and Distribution Piping Systems.” Additionally, each pipeline section may have additional design components. To illustrate, PSEP pipeline facilities also include, as applicable, cathodic protection systems designed to satisfy the requirements of 49 CFR 192, NACE Standard RPO 0169, NACE Standard TM0497, and applicable Gas Standards.

that decreasing the pressure from the spike pressure results in at least a 5% reduction for the entire pipe section. Exceptions to spike testing requirements must be approved by SDG&E/SoCalGas Pipeline Engineering. Spike testing is not recommended when the spike would exceed the actual or likely mill test pressure, and elevation changes require a significant number of additional spike test sections.

3. Maximum Test Pressure

For those portions of existing Line 1600 that are proposed to be hydrotested, SDG&E and SoCalGas plan to test the existing line to at least 1.5 times its desired MAOP of [REDACTED] psig. This equates to a minimum test pressure of [REDACTED] psig. In order to safely test the existing line, SDG&E and SoCalGas will not exceed 90% of the SMYS of the pipe, by dividing Line 1600 into multiple test sections to address elevation changes that otherwise can significantly increase test pressures at low points. Based on preliminary engineering, SDG&E and SoCalGas anticipate the maximum test pressure that existing sections of Line 1600 will experience will be [REDACTED] psig, or [REDACTED] of SMYS, in the Rice Canyon section, which has the highest elevation change. Table 5 below summarizes the characteristics of each of the sections of existing pipe planned for hydrotest, including the maximum test pressure at the lowest elevation.

TABLE 5
Summary of Hydrotest Project Sections

Hydrotest Section	Start Elev (ft)	High Elev (ft)	Low Elev (ft)	Elev Change (ft)	Part 192 Test Range (psi)	Spike Test Range (psi)	Max Spike Press @ Low Elev (psi)	% SMYS @ Low Elev
Rice Canyon	1159	1159	289	870	■	■	■	■
Couser Canyon North	289	935	283	652	■	■	■	■
Couser Canyon South	898	1374	722	652	■	■	■	■
Moosa Creek	713	713	686	27	■	■	■	■
Daley Ranch	704	731	625	106	■	■	■	■

The replacement sections of pipeline also will be subject to hydrotest. Newly installed pipeline sections will be tested to satisfy SDG&E and SoCalGas strength test procedures. The new line will be tested to at least 90% SYMS according to SDG&E standard G7369. SDG&E and SoCalGas plan to install ■ inch diameter, ■ inch wall thickness, grade ■ pipe for new installations. The minimum test pressure for this pipe at 90% of SMYS equates to ■ psig. Should some installations result in a combination of new pipe being interconnected with sections of existing modern ■-inch wall, grade ■ pipe (non-A.O. Smith EFW pipe), minimum test pressures will be adjusted accordingly to fall within a range of ■ psig to ■ psig, as determined by SDG&E and SoCalGas' Gas Engineering department. This test pressure range equates to 1.5 times the original MAOP rating of 800 psig, at the lower end, to 90% of SMYS for the ■-inch wall pipe at the upper end.

4. Materials Standards and Practices

Once a testing or replacement project has been scoped, designed, and approved, materials are ordered that comply with SDG&E and SoCalGas' Materials Specifications for Gas

Operations. Unless otherwise specified, API 5L pipe, with the specific approved grades and wall thicknesses, are used. These wall thicknesses and grades for each diameter pipe are as specified in applicable standards and Materials Specifications for Gas Operations. The required wall thicknesses for the various class locations are determined and verified using design data. Table 6 below summarizes the generally applicable Materials Specifications for Gas Operations.

TABLE 6
Generally Applicable Materials Specifications for Gas Operations

Pipe	MSP 41.06.1	Pipe - Steel, Grades A25 Through X70
	MSP 52.83	Fittings - Forged Steel
Fittings	MSP 52.96	Fittings – Butt-Weld Steel
	MSP 58-15.1	Valves - Ball, Small (High Pressure)
Valves	MSP 58-15.2	Valves; Ball, Steel Floating
	MSP 58-20	Valves - Check
	MSP 58-82	Valves; Ball, Steel, Trunnion Mounted
Coatings	MSP 44-50	Fusion Bonded Epoxy External Line Pipe Coating
	MSP 44-50.1	Fusion Bonded Epoxy External Fitting Coating
	MSP 44-50.4	Powder Coating for External Protection of Prefabricated Gas Components

Materials Specifications for Gas Operations are used for each purchase and outline the instructions and expectations for shop inspections and quality assurance. To validate adherence to these standards, SDG&E and SoCalGas may inspect and test materials to help verify the accuracy of the manufacturer’s certification and testing, to promote compliance with company requirements and, if applicable, the Materials Specifications for Gas Operations Quality Control Inspection Instructions. Documentation of compliance and certification is retained.

5. Construction Standards and Practices

Construction is subject to extensive standards, practices, and guidelines. First, SDG&E and SoCalGas enforce guidelines on how contractors are qualified to work on the system.¹⁷ Contractors are not permitted to commence working on the SDG&E/SoCalGas system until they have demonstrated compliance with applicable requirements and Gas Standards and demonstrated appropriate financial and insurance capabilities.

In addition to these threshold requirements to begin work, SDG&E and SoCalGas implement comprehensive standards that address, among other areas, excavation, coating application and inspection, welding, welding inspection, trenching, cover, and pressure testing. Prior to starting work, as a part of the agreement with the contractor, contractors are provided an index of standards, practices, guidelines, and requirements; as applicable, contractors are provided updates when issued. SDG&E and SoCalGas monitor and document compliance with applicable standards, laws, and requirements.

Direct management of the project construction activities is the responsibility of SDG&E and SoCalGas' Construction Management organization. The organization is structured to provide oversight and monitor whether construction is meeting quality standards in a safe construction

¹⁷ Contractors are thoroughly vetted and must, among other requirements: have a record of job and safety performance; demonstrate approved production and technical equipment and facilities; demonstrate approved Operator Qualification program, as required by 49 CFR 192.801 through 192.809; demonstrate an adequate quality assurance and safety program; have a Department of Transportation (DOT)-and Company-approved Alcohol & Drug Testing Program in accordance with the DOT CFR, Title 49, Part 40 and Part 199 regulated by the Pipeline & Hazardous Materials Safety Administration (PHMSA) or Part 382 if contractor's employees perform commercial motor vehicle driver functions regulated under the DOT Federal Motor Carrier Safety Administration's (FMCSA) Part 382; demonstrate the contractor is meeting State and Federal requirements for the installation and construction of natural gas pipelines (49 CFR 190, 191, 192) Cal Occupational Safety and Health Administration (OSHA) or any other state requirements; and maintain a California Contractors State License.

environment at an economical total cost. The organization also provides extensive oversight with respect to safety, environmental protection, site security, construction contract management and administration, planning, scheduling, progress control, cost control, inspection, job site material and logistics management and job site customer interface management. For example, during construction, inspection reports are generated to detail the work, photograph aspects of the work, and document the standards applicable to the work performed during the day (as well as compliance with those standards). Company employees, as well as third party inspection service providers, verify compliance with standards.

In addition, an assigned Project Manager and other key members of the Project Management Team assist the Construction Management team and provide management and project support, particularly with respect to engineering, constructability, procurement follow-up, inspection/expediting of purchased equipment and materials, and other specialized services as may be required to support construction. While each construction activity is subject to extensive guidelines, standards, and requirements, welding in particular is discussed in greater detail below.

6. Welding and Welding Inspection

SDG&E and SoCalGas adhere to applicable laws, regulations, and Gas Standards for welder qualification and re-qualification. As such, SDG&E and SoCalGas qualify and re-qualify company and contractor welders in accordance with Title 49 of the Code of Federal Regulations.¹⁸

¹⁸ 49 CFR Parts 192.227 Qualification of welders, and 192.229 Limitations of welders.

SDG&E and SoCalGas prepare a Welder Qualification Test Report when a welder is qualified, maintain a list of qualified personnel, and conduct destructive testing on steel weld samples submitted by welders in accordance with 49 CFR 192 and API 1104 (revision incorporated by reference in 49 CFR Part 192). Subsequently, welders must regularly be requalified. Qualification compliance is monitored by requiring welders to carry proof of certification and verifying their qualifications when performing welding or joining operations.

To provide further oversight, welding inspections are performed by qualified welding inspectors and each weld undergoes non-destructive examination (NDE).¹⁹ Inspection of a weld takes multiple forms. First, the welding inspector performs quality checks prior to and during the welding process. Second, the welding inspector performs a visual inspection of the weld. Finally, an NDE technician inspector performs non-destructive testing, such as radiographic or ultrasonic inspection. Company and contract personnel performing non-destructive testing are certified according to API-1104 and ASNT-SNT-TC-1A and provide, upon request, a current certification record demonstrating qualification for Task 1.25-0601 – Radiography Examination – 49 CFR 192.243 Nondestructive Examination.

¹⁹ Qualified inspectors must demonstrate knowledge and understanding of high pressure steel pipeline materials and components; be CWI (Certified Welding Inspector), CPWI (Certified Pipeline Welding Inspector) or an equivalent certification or training deemed acceptable; demonstrated experience and knowledge in API Standard 1104; have NDT (non-destructive testing) experience and or certification preferred for RT (radiographic) and PT (penetrant) inspections; passing required PSEP operator qualification (OQ) Covered Common Tasks (CCTs); be qualified to perform visual weld inspection in accordance with the recommendation of ASNT or any recognized certification program that is acceptable to the Company; and qualified under task 0811 to perform Visual Inspection of Welding and Welds.

7. Steel Pipeline Materials (49 CFR 192.55)

SDG&E and SoCalGas utilize greater pipe base metal and pipe toughness than required by API5L. API5L requires the steel pipe to have a minimum average (from a set of three specimens) absorbed energy for each heat based on full-size transverse specimens to 20 ft-lbs. SDG&E and SoCalGas exceed this requirement by applying a Charpy energy equation which calculates a value greater than 29 ft-lbs. By exceeding the API5L requirements, the proposed Plan is designed to provide greater resistance to propagating cracks and increases the pipe's resistance to third party damage.

8. Steel Pipe Design Factors (49 CFR 192.111)

The design factor of a pipe section establishes the safety margin against pipe yielding from its internal pressure.²⁰ For example, a pipeline in a Class 3 location is required to have a design factor of 0.5 or lower. This limits the maximum pressure in a pipe section to half of its yield pressure, which is equivalent to having a safety factor of 2, based on yield. Table 7 below summarizes the code requirements for design factors based on the class location of a pipe section.

²⁰ For clarity, the term "yielding" does not mean the pipe ruptures but rather refers to permanent deformation. Pipe has additional strength beyond its yield point.

TABLE 7
Summary of Minimum Design Factors Required Under Federal Regulations

Class Location	Description of Class Location	Design Factor
1	10 or fewer buildings intended for human occupancy.	0.72
2	More than 10 but fewer than 46 buildings intended for human occupancy.	0.60
3	46 or more buildings intended for human occupancy, or an area where the pipeline lies within 100 yards of either a building or a small, well-defined outside area (such as a playground, recreation area, outdoor theater, or other place of public assembly) that is occupied by 20 or more persons on at least 5 days a week for 10 weeks in any 12-month period.	0.50
4	Where buildings with four or more stories above ground are prevalent	0.40

Population densities along the proposed Plan vary by location from a mixture of Class 1, Class 2 and Class 3 in the northern reaches of the pipeline to predominately Class 3 and Class 4 in the high density urban areas in the south. SDG&E and SoCalGas plan to design the northern section of the pipeline between Rainbow and Escondido to meet Class 3 requirements. The southern section from Escondido to Mission Station is planned to be designed to meet Class 4 requirements. This will satisfy design code requirements and provide an additional safety margin to accommodate future growth and development should the class location change.

9. Transmission Line Valves (49 CFR 192.179)

The proposed Plan is designed to enable detection of a significant change in pipeline pressure within two minutes in designated Class 3 and/or HCA sections and for full depressurization of the segment within 30 minutes should a failure occur. This design criteria will meet or exceed PSEP objectives for isolation and depressurization of sections of a pipeline, which

already exceed Code requirements.²¹ All new Main Line Valves (MLVs) installed pursuant to this Plan will have capabilities for remote operation by SDG&E and SoCalGas' Gas Control Center and/or automatic closure without operator intervention in the event of a significant failure. Further, valves on selected taps, crossovers and bridle assemblies will be equipped with remote control capabilities to support operation of the pipeline and prevention of back-flow of gas into any main pipeline section isolated to control an unplanned gas release. MLVs will have actuators that reside above ground or will be installed below grade within a concrete vault. The actuator will operate using gas pressure provided from the pipeline, supported by pneumatic and electronic controls. The MLVs will be 24 inch, full-opening, to allow for the passage of internal inspection devices. Each MLV location will have a blow down valve installed on each side of the MLV to allow for depressurization of either of the adjoining pipe sections. The Plan calls for a maximum spacing between MLVs of five miles unless other constraints require spacing more than 5 miles apart. In all locations, five-mile spacing meets or exceeds Code requirements, which specify maximum valve spacing of 20, 15, 8 and 5 miles for Class 1, Class 2, Class 3 and Class 4 locations, respectively. The reduced valve spacing will enable a faster blow down time for all pipe sections than would be achieved if the less-stringent valve spacing requirements of the Code were followed.

10. Inspection and Testing of Pipeline Welds (49 CFR 192.241)

The Federal Code requires non-destructive testing for pipelines constructed in Class 1 and

²¹ A.11-11-002, Amended Testimony of Southern California Gas Company and San Diego Gas & Electric Company in Support of Proposed Natural Gas Pipeline Safety Enhancement Plan, Chapter V, Proposed Valve Enhancement Plan, dated December 2, 2011, <http://www.socalgas.com/regulatory/documents/r-11-02-019/Amended%20Testimony-12.2.11.pdf>.

Class 2 locations that are not in highway or railroad rights-of-way on 10% and 15% of welds, respectively. SDG&E and SoCalGas plan to exceed the requirement by performing non-destructive testing of 100% of the welds and non-destructive examination by dye penetrant of branch connections for pipelines in these areas.

11. Protection from Hazards (49 CFR 192.317)

The pipeline route in this proposed Plan does not cross any active seismic faults. Based on a preliminary assessment, the pipeline also does not traverse any potential landslide areas. Typical mitigation for potential landslides is to slightly reroute the pipeline away from potential landslide areas or to install the pipe at a depth below the slide plane of the landslide. Should any landslides be discovered during detailed design, further site-specific geological investigation will be performed to select the appropriate mitigation method.

12. Strength Test Requirements (49 CFR 192.505)

The proposed Plan will traverse Class 1, Class 2, Class 3 and Class 4 locations. The pipe material (12-inch diameter by 0.375-inch wall, Grade X42) to be used in replacement projects provides enhanced safety benefits as it satisfies the more rigorous requirements for Class 4 locations. As a result, the pipeline will have greater strength and safety margins than is required by the Code in Class 1, Class 2, and Class 3 areas.

Another safety factor anticipated to be incorporated into the final design of each replacement project section is at the pressure testing phase. Where practical, the new installed pipe is planned to be tested to more than 2.5 times the MAOP, which provides an additional 66% safety factor beyond even the more rigorous testing requirements for Class 3 and Class 4 locations. The pressure testing will also include a short duration pressure spike to provide an

additional factor of safety.

13. Odorization of Natural Gas (49 CFR 192.625)

All natural gas flowed through Line 1600 will be odorized. Odorized gas enhances the ability to detect leaks.

14. Patrolling of Line 1600 (49 CFR 192.705)

Consistent with SDG&E and SoCalGas standards, where feasible, new 30-inch pipeline installed as part of the Plan will be equipped throughout its routing with an advanced right-of-way intrusion detection/monitoring fiber optics system to provide early warning when digging, drilling, boring, cutting, compacting, or unplanned heavy vehicle operations by third parties pose a threat to pipeline integrity. The system will also continuously monitor for ground movement and temperature gradients associated with an unplanned release of gas from the pipeline. This fiber optics monitoring program is consistent with the company standard requiring new and replacement pipelines to be outfitted with fiber monitoring technology. This requirement applies to pipelines that are being installed that are one mile or greater in length, 12 inches or greater in diameter, and operate above 20% SMYS. Fiber optic cable will be installed during construction and will be coupled to a computer-based monitoring station for detection and alerting purposes. The system of sensors is intended to allow for preemptive identification and mitigation of pipeline threats and enhance SDG&E and SoCalGas' ability to manage pipeline risk.

V. TECHNICAL CONSIDERATIONS

In evaluating the four alternatives considered during the preparation of this Plan, SDG&E and SoCalGas carefully considered the technical attributes and installation history of Line 1600,

along with the integrity assessment and operational and maintenance history of the line. A summary of these technical considerations is provided in this section.

A. Pipeline Attributes and Installation History

Line 1600 was placed in service in 1949 and is primarily comprised of 16-inch diameter, 0.250-inch wall, grade [REDACTED] pipe. It is approximately 50 miles long, with 46.5 miles (approximately 93%) of the pipe comprised of 1949-vintage electric flash welded (EFW) pipeline sections, with a small percentage of electric resistance welded (ERW) pipe. Additionally, approximately 33 miles (approximately 66% of the total length) of Line 1600 is located in HCAs, with significant residential and commercial development along the pipeline's existing route. Line 1600 contains the largest mileage of flash welded pipeline within HCA in the combined SDG&E/SoCalGas Gas System.

SDG&E and SoCalGas do not have documentation to demonstrate that Line 1600 was pressure tested when it was originally placed into service in 1949, and Line 1600 was grandfathered under federal pressure testing regulations adopted in 1970.²²

B. Line 1600 Vintage Pipe Material and Manufacturing Related Anomalies

Line 1600 was originally constructed in 1949 with predominantly EFW pipe, and a small percentage of ERW pipe. In February 2017, Kiefner and Associates, Inc. published a technical report (2017 Kiefner Report) which reviewed and analyzed risk factors to evaluate whether Line

²² See D.11-06-017 at 5, n.3.

1600 may prudently be pressure tested and restored to full operating pressure.²³ Some of the salient findings presented in the report are summarized below.

The 2017 Kiefner Report explains that electric flash welding of long seams is an obsolete form of pipe manufacturing where the longitudinal edges of heat softened pipe are forced together to form a welded bond. Excess extruded material is then trimmed away, forming the classic “box-like” appearance of a flash welded seam. This process was only utilized by a single pipe manufacturer—A.O. Smith Corporation—and pipe production using flash welded seams was discontinued by 1969. Process control, material chemistry, and manufacturing-related factors all contribute to EFW seam weld quality issues and related anomalies in such pipe.

The A.O. Smith EFW pipe is associated with a number of well-documented integrity concerns including hook cracking, cold welds, non-metallic inclusions, susceptibility to selective seam corrosion, and a variety of other related issues.²⁴ Among the types of anomalies listed above, hook cracks associated with the EFW seam welds have been observed on Line 1600.

Hook cracks (also known as upturned fiber imperfections) take their name from the distinctive “J-shaped” flaw that results when metal separations in the steel skelp²⁵ that are originally oriented parallel to the skelp surfaces are forced together, resulting in flow of the

²³ Rosenfeld, M.J., “Review of Risk Factors for Line 1600,” Kiefner Final Report to SDG&E, February 20, 2017. See also A.15-09-013, Supplemental Testimony of SDG&E and SoCalGas at Attachment C (2017 Kiefner Report).

²⁴ J.F. Kiefner and E.B. Clark, *History of Line Pipe Manufacturing in North America* (1996 Kiefner Report), American Society of Mechanical Engineers (ASME) CRTD-Vol. 43 (1996).

²⁵ Skelp is a strip of metal (such as wrought iron, steel) for making a hollow cylindrical piece or tube by bending it round longitudinally or helically and welding.

material toward either the inner or outer surface of the resultant weld.²⁶ Additionally, selective seam corrosion - preferential metal loss that occurs at a weld bond line region or heat affected zone (HAZ) – remains a threat to the integrity of Line 1600. This phenomenon is promoted by localized galvanic differences in the weld and surrounding material and, when exposed to a corrosive environment, results in the preferential attack of the weld area at an accelerated rate relative to the surrounding pipe material.^{27,28}

The 2017 Kiefner Report further explains that the vintage A.O. Smith flash welded pipe is known to have both hook cracks and low fracture control. The objective of “fracture control” is to prevent leaks and ruptures caused by crack propagation initiated by an event, such as third-party damage. Fracture control has traditionally been categorized as “initiation control” and “propagation control.” “Toughness” may be broadly defined as the ability of a material to absorb energy during fracture. Sufficient toughness is an essential component of fracture control, as it increases the likelihood that a failure will be progressive, and not catastrophic.

The 2017 Kiefner Report further states that A.O. Smith pipe installed in 1949 was not manufactured with fracture control in mind because the concept was not known at the time. While the pipe has good mechanical strength, its propagating fracture control properties do not meet modern criteria for gas transmission pipelines. The implication of these inherent properties of Line 1600 is that at its current operating pressure, in the event of a failure on the sections of vintage pipeline that remain in service, particularly in the seam but potentially even

²⁶ J.F. Kiefner with the assistance of the Interstate Natural Gas Association of America (INGAA), *Evaluating the Stability of Manufacturing and Construction Defects in Natural Gas Pipelines, Department of Transportation Final Report 05-12R* (2007 Kiefner Report), Table A-1 (Apr. 26, 2007).

²⁷ *Id.* at Table 3.

²⁸ 1996 Kiefner Report, at 5-4.

in the pipe body, a failure could result in a rupture and propagating brittle fracture rather than a leak. Although the inherent properties of Line 1600 vintage pipe do not render the line unsafe at current operating pressures, they do increase the vulnerability to certain integrity threats or increase the difficulty of defending against those threats. Consequently, it is accurate to state that a vintage pipeline poses a higher risk to the public than a new pipeline, even when the vintage pipeline appears to be in a safe condition.

The modern [REDACTED]-inch diameter, [REDACTED]-inch wall thickness Grade [REDACTED] pipe proposed as Line 1600 replacement material will provide superior fracture control properties compared to the vintage A.O. Smith pipe material. In addition, SDG&E and SoCalGas' proposed wall thickness ([REDACTED]-inch) for the [REDACTED] inch replacement pipe will provide greatly improved resistance to mechanical excavation damage compared to the vintage pipe material (0.250-inch wall thickness), further enhancing the long-term safety of the pipeline.

C. Integrity Monitoring and Operations & Maintenance Repair History of Line 1600

Continual and active integrity monitoring is a key component of pipeline safety and will continue to be an important part of SDG&E and SoCalGas' continued safe operation of Line 1600. Integrity monitoring of Line 1600 includes (but is not limited to) monitoring conditions such as selective seam corrosion, corrosion coincident with hook cracks, or other forms of interaction between threats such as third-party damage at otherwise stable defect locations.

Since installation in 1949, a combined total of approximately two dozen repairs associated with routine operations and maintenance (O&M) activities have taken place on Line 1600. These repairs are representative of typical maintenance for a pipeline of this size and vintage, and do not significantly impact the integrity condition of the pipeline. A review of the

repair and maintenance history is incorporated into the assessments conducted as part of SDG&E and SoCalGas' Transmission Integrity Management Program (TIMP).

D. Line 1600 Integrity Assessment History

In accordance with 49 Code of Federal Regulations (CFR) sections 192.921(a)(3) and 192.937(c)(1), three TIMP-related assessments have been conducted on Line 1600: (1) an External Corrosion Direct Assessment (ECDA) in 2007; (2) a series of in-line inspections (also known as "smart pigging") conducted from 2012-2015; and (3) a subsequent in-line inspection in 2016.

E. External Corrosion Direct Assessment

The baseline ECDA of pipe sections within HCAs on Line 1600 was completed on February 23, 2007. Inspections were performed over approximately 20.7 miles, resulting in eleven examinations to investigate the likelihood of active external corrosion. External corrosion and third-party damage were not observed during examinations of the excavated pipe and no repairs were required.

F. In-Line Inspection Phases

A TIMP assessment of Line 1600 was conducted utilizing a series of in-line inspections from December 2012 through December 2015. All pipe sections between the launcher and receiver (*i.e.*, both HCA and non-HCA sections) were inspected using axial magnetic flux leakage (AMFL), circumferential magnetic flux leakage (CMFL, also known as transverse field inspection or TFI), and geometry smart pigs. AMFL technology is sensitive to volumetric flaws, such as metal loss caused by corrosion or third-party damage; CMFL technology is sensitive to some

types of long seam flaws, such as selective seam corrosion and hook cracking; and geometry tools detect areas of deformation.

During the inspection work completed from 2012-2015, the inspection of Line 1600 was performed in three separate phases, primarily due to the break in geometric continuity created by the reduction in pipeline diameter from 16-inch down to 14-inch diameter (near the middle of the pipeline at Lake Hodges), and back up again to 16-inch diameter for the remainder of the pipeline. The phases are numbered from 1 to 3 in the chronological order of inspection. The inspection lengths, in-line inspection tools utilized, and dates for each inspection phase are summarized in Table 8 below.

TABLE 8
In-line Inspections of Line 1600 by Phase (2012-2015)

Phase	Inspection Length (miles)	Inspection Extent	ILI tools	Assessment Date
1	29.1	Rainbow Metering Station to Lake Hodges	<ul style="list-style-type: none"> • Axial MFL • Geometry 	12/5/2012
			<ul style="list-style-type: none"> • Circumferential MFL 	2/6/2013
2	20.1	Lake Hodges to Mission Base	<ul style="list-style-type: none"> • Axial MFL • Geometry 	12/19/2013
			<ul style="list-style-type: none"> • Circumferential MFL 	3/20/2014
3	0.5	Lake Hodges	<ul style="list-style-type: none"> • Axial MFL • Geometry 	12/10/2015

G. Findings from 2012-2015 In-line Inspections

The final reports for each of the in-line inspection phases for Line 1600 identified anomalies:²⁹ in Phase 1, 1,471 anomalies were identified; in Phase 2, 1,226 anomalies were identified; and in Phase 3, 85 anomalies were found. Reported anomaly types and quantities for

²⁹ Anomalies refer to unexamined pipe features that are classified as potential deviations from sound pipe material, welds, or coatings. All engineering materials contain anomalies that may or may not be detrimental to material performance.

each phase are listed in Table 9 below. Due to differences in tool sensitivities, the quantity of anomalies listed for the CMFL tool for Phases 1 and 2 contain anomalies that were detected by the AMFL and geometry tools (*i.e.*, anomalies may have been counted twice). Discounting the repairs that have been completed on Line 1600, the AMFL in-line-inspection work completed in 2016 resulted in similar findings as those identified through the 2012-2015 assessments summarized in Table 9 below.

TABLE 9
In-line Inspection Reported Anomalies (2012-2015)

Reported Anomaly Type	Phase 1		Phase 2		Phase 3
	AMFL and Geometry	CMFL	AMFL and Geometry	CMFL	AMFL and Laser Deform.
Crack-like	0	3	0	14	0
Deformation	47	116	28	33	0
Long Seam	123	265	100	198	0
Manufacturing	18	20	134	40	6
Metal loss	343	536	148	531	79
TOTAL	531	940	410	816	85

H. Inspection Based Repairs Related to 2012-2015 In-Line Inspections

Validation of smart pig data by direct examination is necessary to correlate the smart pig data against actual findings confirmed in the field by unearthing the pipe. Though smart pigs provide much valuable and accurate data, they are not without limitations. Smart pigs detect many anomalies, but are not infallible, and cannot detect *all* anomalies in a pipeline during an in-line inspection. For Phases 1 and 2, a total of 62 direct examinations (*i.e.*, excavations) of Line 1600 were conducted to validate the anomalies reported by the smart pigs. Nineteen examinations either directly confirmed the presence of hook cracking or were determined to likely be hook crack-related. Six examinations were performed at locations where crack-like

anomalies were reported, and hook cracking was confirmed in all six locations. Thirteen examinations were performed at locations where manufacturing-related metal loss was detected at the longitudinal seam: hook cracking was confirmed at four locations, and hook cracking was determined to be likely at the remaining nine locations. Where appropriate, anomalies associated with the pipe long seam and base metal flaw, as well as mechanical damage, were remediated through a combination of replacing sections of pipe, installing repair bands, or grinding out smaller base metal or workmanship flaws. Findings from the direct examinations resulted in the following remediation activities:

- Ten cylindrical replacements (totaling approximately 290 feet) to remediate³⁰ a mechanical damage defect and mitigate³¹ 140 flaws (approximately 77% were longitudinal seam weld and base metal flaws from the pipe manufacturing process),
- 39 repair bands to remediate 17 defects due to both mechanical/third-party damage and 68 nearby flaws (approximately 87% were longitudinal seam weld and base metal flaws from the pipe manufacturing process), and
- 84 repairs to mitigate workmanship and base metal flaws from the construction and manufacturing process.

I. Existing State of Line 1600

During 2016, SDG&E and SoCalGas completed an additional AMFL in-line inspection of Line 1600. An inspection using CMFL technology was also initially planned, but in-line inspection vendors raised the concern that available CMFL tools were unlikely to successfully navigate Line 1600 due to the presence of shorter radius elbows throughout the pipeline. SDG&E and SoCalGas attempted to obtain the same CMFL tool that previously successfully inspected Line

³⁰ Remediate means an operation or procedure that transforms an unacceptable condition to an acceptable condition by eliminating the causal factors of a defect.

³¹ Mitigate means the limitation or reduction of the probability of occurrence or expected consequence for a particular event.

1600; however, that tool had been decommissioned and permanently retired. SDG&E and SoCalGas worked with the CMFL in-line inspection vendors and selected the tool thought to have the highest chance of successfully negotiating the geometry of Line 1600. In November 2016, an attempt to run the selected tool was initiated but resulted in failure when the tool became lodged in the pipeline. This resulted in a shutdown of a section of the line so the tool could be extracted. To date, the inability to perform in-line inspections of Line 1600 using CMFL technology remains an outstanding concern. Consistent with the Commission's directives in D.11-06-017 and the statutory requirements of Public Utilities Code section 958, the scope of work identified in this Plan includes the work necessary to retrofit or replace shorter radius elbows and other legacy features in Line 1600 that prevent SDG&E and SoCalGas from using CMFL technology to complete in-line inspections of Line 1600.³²

Assessment data from both in-line inspection technologies demonstrate that for the remaining anomalies in Line 1600, adequate safety margins exist for operation at both its current MAOP of 512 psig and at its previous MAOP of 640 psig. Under 49 CFR section 192.939(a), operators are required to establish a reassessment interval for each covered section and prescribes methods for determining an interval based upon the safety margins calculated for remaining flaws. The maximum reassessment interval allowed under TIMP for any covered section is seven years, although findings may yield longer duration intervals as prescribed in 49 CFR sections 192.939(1) through 192.939(3). A covered section is assigned a maximum

³² See D.11-06-017 at 32, Ordering Paragraph 8 ("The Implementation Plan must consider retrofitting pipeline to allow for in-line inspection tools. . . .") and Cal. Pub. Util. Code § 958 ("At the completion of the implementation period, all California natural gas intrastate transmission line segments shall . . . [w]here warranted, be capable of accommodating in-line inspection devices.").

reassessment interval when the remaining flaws are not expected to exceed acceptable safety limits prior to the next assessment. Each integrity assessment of Line 1600 has resulted in a maximum reassessment interval of seven years.

While Line 1600 is safe for service as it is being operated today, to continue operating the pipeline at a transmission service level, it must be pressure tested or replaced as part of PSEP.

As the 2017 Kiefner Report concludes, “While there is no evidence that Line 1600 is unsafe, there is much that is unknowable about the line, including the ability of girth welds to withstand loadings from natural events, and features in the longitudinal seams. Risk is proportional to what is unknown, at least in part.”³³ Though the study specifically referred to the 36-inch diameter replacement pipeline proposed in A.15-09-013, the identified concerns pertaining to the operation of vintage pipe sections remain the same. All new sections of modern pipe installed to replace legacy pipe sections will eliminate gaps in integrity data that contribute to risk. As discussed in greater detail in this Plan, although replacement of the entirety of Line 1600 may be a more cost effective investment in the long term, replacing portions of Line 1600 in HCAs and pressure testing portions of Line 1600 in non-HCAs is a reasonable approach to bringing Line 1600 into compliance with the Commission’s directives in D.11-06-017, D.14-06-007, D.18-06-028, and Public Utilities Code section 958 as soon as practicable.

³³ 2017 Kiefner Report at 2 and 31.

VI. ADDITIONAL PUBLIC SAFETY AND PROPERTY/ENVIRONMENTAL PROTECTION MEASURES

A. Interim Safety Enhancement Measures

SDG&E and SoCalGas have implemented several safety enhancement measures with respect to Line 1600 to increase the margin of safety and validate the integrity of the line pending completion of pressure testing or replacement activities under PSEP. These interim safety measures include pressure reductions, in-line inspection assessments, and conducting instrumented leak surveys at greater frequencies.

The historic MAOP of Line 1600 was 800 psig. SDG&E and SoCalGas reduced the MAOP to 640 psig in 2011 and then again to 512 psig in July 2016.³⁴ Lowering the MAOP of Line 1600 to 31.5% of its specified minimum yield strength (SMYS) increases the margin of safety for Line 1600, partially mitigating the integrity risks associated with the pipeline.

In addition to the second pressure reduction noted above, in Resolution SED-1 dated August 18, 2016 (Resolution), the Commission directed SDG&E and SoCalGas to perform several interim safety measures on Line 1600. In compliance with the Resolution, the following actions were or are being taken to enhance the safety of Line 1600 until implementation of the Plan is complete:

- During July 2016, the operating pressure was reduced with maximum limits set not to exceed 512 psig.

³⁴ In July 2011, the Utilities voluntarily reduced the MAOP of Line 1600 to 640 psig in response to the safety recommendations issued by the National Transportation Safety Board on January 3, 2011. See R.11-02-019 *Report of Southern California Gas Company (U 904 G) and San Diego Gas & Electric Company (U 902 G) on Actions Taken in Response to the National Transportation Safety Board Safety Recommendations* (April 15, 2011). On July 8, 2016, the Commission's Executive Director ordered the Utilities to reduce the MAOP of Line 1600 further to 512 psig. This was ratified in Commission Resolution SED-1.

- An additional in-line inspection was performed in 2016 using an axial magnetic flux leakage tool, with the exception of the Lake Hodges crossing, which had just recently been inspected in 2015.
- Replaced the section at Engineering Section 17-31.
- Performing bi-monthly instrumented leak surveys.

In summary, in-line inspection-related repairs coupled with the reduced operating pressure on Line 1600 have already created a significant safety margin to allow the line to continue to operate at its current capacity until replacement and pressure testing can be completed in association with the Plan outlined in this document.

B. List of Structures Abutting or Within Existing Line 1600 Easement

As part of developing the Plan, and in conformance with D.18-06-028, SDG&E and SoCalGas performed an analysis to identify structures that abut or encroach within the existing rights-of-way (ROW) for Line 1600. In D.18-06-028 (at 92), the Commission orders SDG&E and SoCalGas to:

[P]rovide a detailed summary of existing physical commercial and residential structures that directly abut the edge of the easement (and any possible encroachments that lie within the easement) on Line 1600, including GPS coordinates. Based on this analysis, Applicants shall also identify proposed rerouting of the line in specific sections and/or removal or moving of specific physical structures, known at this time, due to safety compliance reasons.

SDG&E and SoCalGas continuously monitor the rights-of-way of transmission pipelines, including Line 1600, to identify surface conditions on or adjacent to pipeline ROWs, construction activity, encroachments and other factors that could impact the safety and operation of transmission pipelines. Commission GO 112-F, section 143.5, Encroachments, establishes the following requirements for natural gas pipeline operators in California:

With the exception of gas pipeline facilities related to installations in gas meter rooms or other specially designed indoor locations where an outdoor meter installation is not possible or practical, a utility transporting LNG, natural gas or other gas shall not construct any part of a LNG, natural gas or other gas pipeline system under a building. In addition, the utility shall not allow a building or other encroachments to be constructed on to its pipeline right-of-way that would hinder maintenance activities on the pipeline or cause a lengthy delay in accessing its pipeline facilities during an emergency. If the utility finds a building or other encroachment built over a pipeline facility after the effective date of this section, then the utility may require the party causing the encroachment to remove the building or other encroachment from over the pipeline facility or to reimburse the utility for its costs associated with relocating the pipeline system.³⁵

In preparing this Plan, SDG&E and SoCalGas conducted a detailed assessment of the Line 1600 ROWs and adjacent structures to compile the information required to be included in the Plan under D.18-06-028. This assessment confirms there are no known encroachments on Line 1600 that would hinder maintenance activities on the pipeline or cause a lengthy delay in accessing Line 1600 during an emergency.

While the width of the existing Line 1600 varies in some locations, the existing Line 1600 ROW is predominantly 20 feet wide, with the pipeline generally located along the center of the easement. For the purposes of preparing the analysis required under D.18-06-028, SDG&E and SoCalGas identify all structures located within fifteen feet of the pipeline. As described in greater detail below, SDG&E and SoCalGas completed this assessment by analyzing geospatial data and conducting confirmatory field investigations to physically locate the pipeline relative to adjacent structures at identified locations.

³⁵ Consistent with the requirements of GO 112-F, the majority of the easements for Line 1600 contain a provision that precludes landowners from constructing “any building or other structure within 15 feet of any pipe, or plant any trees over said pipe, or drill or dig any well in a location which would jeopardize the safe use and operation of said pipe lines.”

The first step in SDG&E and SoCalGas' process was to analyze available information to identify commercial and residential structures near the pipeline. SDG&E and SoCalGas used the centerline geometry of Line 1600, which is based upon finalized construction completion drawings dimensioned from property boundaries and other land reference points and validated with inertial measurement unit (IMU) results obtained during inline inspection of the pipeline. The source data related to the location of nearby structures is based upon structure geometry that has been digitized as a polygon from orthorectified aerial imagery that is obtained annually through custom flight(s). During this first step, to screen for structures near the pipeline, a conservative buffer of 30 feet was created from the mapped centerline of the pipeline. This screening process identified 250 mapped locations of interest potentially falling within the 30-foot screening buffer.

Next, these locations were further investigated in the field by SDG&E Pipeline Locators who reviewed the sites and marked out and measured the pipeline location relative to the identified sites. Of the 250 identified locations, 216 were confirmed to be located more than 15 feet from the pipeline or of permissible use, such as open space, softball fields, etc. As such, those 216 locations were cleared as not warranting further investigation. SDG&E and SoCalGas identified 34 remaining locations where structures reside within 15 feet from the pipeline. Of these, SDG&E and SoCalGas identified no structures built over the pipeline or in a location that would hinder maintenance activities on the pipeline or cause a lengthy delay in accessing Line 1600 during an emergency.

A summary of these 34 locations is presented in Table 10 below along with GPS points, as required in D.18-06-028. Under the proposed Plan outlined in this document, at any locations

where a structure resides within ten feet of the pipeline, the existing Line 1600 pipeline will be relocated to a new location sufficiently far away from the identified structure.

Table 10
Structures Identified Within or Abutting Line 1600 Easements

[illegible]

ADDRESS/ DESCRIPTION	GPS COORDINATES

C. Environmental Protection Measures

During the planning stages of a project, environmental subject matter experts (SMEs) complete a Detailed Environmental Review (DER). A DER provides the project execution team with a summary of the potential environmental constraints and/or conditions required to be addressed prior to clearing the project for construction. It also identifies potential environmental permits that may be required to complete a project. If a project requires a permit from an environmental agency, environmental subject matter experts prepare and submit the required documents and work with the applicable agency to secure the permit.

Prior to construction the environmental experts may deliver an Environmental Clearance to the PSEP Project Manager and construction team. The Environmental Clearance outlines environmental restrictions or allowances (for example, where vegetation clearing may or may not be permitted). The environmental experts may also provide Worker's Environmental Awareness Procedure (WEAP) training materials for use in informing/educating individuals working on the project. If required for a project, the environmental experts may also contract environmental monitors who work with the construction team to ensure compliance with permit conditions and/or local, state or federal regulations.

VII. PROPOSED PLAN PRELIMINARY COST FORECAST AND ESTIMATING METHODOLOGY

SDG&E and SoCalGas prepared preliminary estimates for each of the design alternatives considered in the preparation of this Plan, in accordance with the Commission's directive in D.18-06-028 to "include best available expense and capital cost projections for each prioritized segment and each test year."³⁶ The preliminary cost estimates presented in this Plan were prepared by a dedicated PSEP cost estimating team³⁷ using the methodology refined by the team over time to estimate in-service pipeline pressure test and replacement projects. Since first implementing PSEP over six years ago, SDG&E and SoCalGas have continued to enhance estimate accuracy by incorporating actual costs and activity timelines encountered. These continuous improvement enhancements have resulted in a more robust estimating tool and process that incorporates the input of subject matter experts. These subject matter experts apply their respective expertise and professional experience to provide estimate assumptions for their respective areas, which then form the basis of each estimate.

SDG&E and SoCalGas assessed the project parameters, conducted site visits to determine feasibility of construction within existing rights-of-way and relocation routes, developed preliminary designs and reviewed maps, and analyzed environmental restrictions and workspaces. The project cost estimates consider project execution, engineering design, and construction considerations, as further described below. As described in greater detail below, the cost estimates for the alternatives presented in this Plan utilized subject matter expertise and professional experience to develop the assumptions that form the basis of each

³⁶ D.18-06-028 at 91.

³⁷ In 2015, SDG&E and SoCalGas formed a dedicated estimating department to increase focus on the quality and accuracy of estimates.

estimate. As also described in further detail below, estimates are based on the best information available at this engineering, design and planning stage and, as such, SDG&E and SoCalGas expect both foreseeable and unforeseeable conditions to be encountered during construction that will result in actual expenditures that vary from these initial preliminary estimates.

A. Proposed Plan Preliminary Cost Forecast

Tables 11a and 11b below summarizes the direct and fully loaded and escalated preliminary cost forecast for SDG&E and SoCalGas' proposed Line 1600 Test and Replacement Plan. Cost estimates are based on the preliminary scoping of the work, validated by field visits to the proposed construction and testing sites. Given that the scope of work described in the Plan is conceptual at this time, and detailed engineering and project planning will not be completed until after the Plan is submitted, the available information only enables development of a Class 4 level estimate. Annual spending forecasts are based on a combination of project estimates and the anticipated work schedule.

Table 11a
Direct (\$2018) Proposed Plan Preliminary Cost Forecast
(in Millions)

	Cost to Date	2019	2020	2021	2022	2023	2024	Total
Cap	\$ 24	\$ 34	\$ 124	\$ 155	\$ 106	\$ 56	\$ 6	\$ 506
O&M	\$ 2	-	-	-	\$ 6	\$ 18	\$ 13	\$ 39
Total	\$ 26	\$ 34	\$ 124	\$ 155	\$ 112	\$ 74	\$ 19	\$ 545

Table 11b
Loaded and Escalated Proposed Plan Preliminary Cost Forecast
(in Millions)

	Cost to Date	2019	2020	2021	2022	2023	2024	Total
Cap	\$ 30	\$ 41	\$ 152	\$ 193	\$ 134	\$ 72	\$ 8	\$ 630
O&M	\$ 2	-	-	-	\$ 7	\$ 22	\$ 16	\$ 47
Total	\$ 33	\$ 41	\$ 152	\$ 193	\$ 141	\$ 94	\$ 24	\$ 677

In addition to reflecting a more refined cost estimating methodology that better reflects actual costs and timelines incurred on prior PSEP projects, this preliminary estimate reflects the overall escalation of pipeline construction costs that has occurred since similar estimates were prepared for A.15-09-013 more than three years ago. Some costs, such as for steel, have significantly increased over the last three years beyond standard escalation rates. Additionally, to accommodate assessment of 1949-vintage portions of Line 1600 using advanced in-line inspection technology, a greater number of pipeline features must be cut out of the pipe and replaced prior to pressure testing than initially contemplated when estimates were prepared for A.15-09-013.

Notwithstanding improvements in and level of rigor of the estimating methodology implemented by SDG&E and SoCalGas, estimates remain estimates. As such, SDG&E and SoCalGas expect conditions to be encountered that will result in actual expenditures varying from estimates. This forecast is therefore subject to adjustment once detailed engineering, project planning and permitting information becomes available as the Plan moves beyond the high-level preliminary scoping phase. Additional detail regarding the estimating methodology employed by SDG&E and SoCalGas to develop the Plan forecast is described below.

B. Planning and Engineering Design

For the purpose of developing the pressure test estimates in this Plan, SDG&E and SoCalGas undertook the following work:

- Assessment and confirmation of project parameters;
- Site visits;
- Review of feature studies;
- Coordination with SoCalGas/SDG&E Gas Engineering and Pipeline Integrity groups to identify repairs/cut-outs for anomalies and in-line inspection compatibility;
- Development of a pipeline profile using ground elevation data for hydrotest planning purposes;
- Determination of maximum and minimum allowable test pressures, and corresponding sectioning of the pipeline into test sections;
- Development of a high-level preliminary routing and design for each section;
- Desktop environmental review of routing options to identify potential environmental constraints and permits;
- Analysis of seasonal restrictions; and
- Determination of additional valve locations, as required.

C. Development of the Project Cost Estimate

As part of the scope definition process described above, subject matter experts representing key areas of the project planning process have contributed to the estimate development.

In alignment with the Association for the Advancement of Cost Engineering (AACE) Recommended Practice 17R-97, the cost estimate for the various options in this Plan were developed under a Class 4 estimate classification. Class 4 estimates are generally prepared based on limited information and subsequently have fairly wide accuracy ranges. They are

typically used for project screening, determination of feasibility, concept evaluation, and preliminary budget approval. Typically, engineering is from 1% to 15% complete, and would comprise at a minimum the following: plant capacity, block schematics, indicated layout, process flow diagrams (PFDs) for main process systems, and preliminary engineered process and utility equipment lists. In the case of this estimate, the preliminary layout was provided in order to develop quantities and assumptions for construction with support for the project team and construction SMEs.

Class 4 estimates generally use factored estimating methods such as gross unit costs/ratios and other parametric and modeling techniques. In the case of this estimate, a combination of gross unit costs and parametric estimating methods were utilized. Based upon the scope and quantities presented, the estimating department developed construction costs for each key quantity unit. For each option, the quantities were updated to account for high level items with very limited knowledge of the geotechnical conditions, detailed/specific routing, permit or traffic restrictions.

Typical accuracy ranges for Class 4 estimates are -15% to -30% on the low side, and +20% to +50% on the high side, depending on the technological complexity of the project, appropriate reference information, and other risks (after inclusion of an appropriate contingency determination, consistent with industry standard). Ranges could exceed those shown if there are unusual risks.

D. Project Execution

Project Execution subject matter experts provide the following in support of estimate development:

- For replacement projects, analysis of alternatives to replacement (*e.g.*, abandonment, de-rating the line, and non-destructive examination for short sections);
- Validation of appropriate replacement diameter;
- Identification of taps and laterals within pressure test or replacement sections;
- Assessment of potential system and customer impacts and development of mitigation strategies;
- Identification of pipeline features to be cut out prior to a pressure test (*e.g.*, pipeline anomalies, non-piggable features, and obsolete appurtenances);
- Identification of potential valve additions;
- Review and approval of scope of work; and
- Review and approval of project-specific pressure test procedures, when applicable.

E. Engineering Design

Engineering Design consists of performing the planning and engineering design work necessary to provide a scope of work with sufficient detail to develop more robust project cost estimates. The scope of work is intended to facilitate the proximation of all identifiable cost components up to, and including, the completion of construction and close-out. The typical planning and engineering design scope includes the following considerations:

- Assessment and validation of project extent/parameters;
- Physical visit to job site to gain familiarity with the area;
- Development of preliminary design for each work site;
- Development of pipeline profile;
- Identification of pressure test sections based on the minimum and maximum allowable test pressures in order to achieve required test pressures; and
- Identification of any special pipeline crossings for replacement projects (*e.g.*, waterways, railroads, freeways, etc.).

F. Environmental

Environmental subject matter experts conduct a desktop review of the route options, identify potential environmental permits and provide estimated costs for the following items in support of estimate development:

- Environmental Services (consultant support for planning, permitting, field surveys, construction and closeout);
- Abatement of potential asbestos containing material and lead paint, as applicable;
- Water treatment, waste management and disposal costs, as applicable;
- Potential permit fees; and
- Potential mitigation fees.

G. Construction

The forecast of construction costs incorporates input from SDG&E and SoCalGas subject matter experts and impacted organizations including the following elements:

- Input from contractors with construction expertise;
- Field walk with all parties to capitalize on combined expertise for assessment of constructability issues; and
- Review of engineering design package to determine construction assumptions.

H. Land Services

Land Services provides the following in support of estimate development:

- Determination of applicable municipal permit requirements and associated costs;
- Identification of potential laydown/staging yards required for individual projects, and subsequent communication with land owners as required to determine availability; and
- Development of cost estimates associated with laydown yards, temporary construction easements, grants of easement, appraisals, title reports, etc.

I. Compressed Natural Gas/Liquefied Natural Gas (CNG/LNG) Team

The CNG/LNG Team provides the following in support of estimate development:

- Provision of analyses on impacted customer natural gas loads to determine optimal process for keeping customers online; and
- Development of cost estimates for the provision of CNG/LNG.

J. Supply Management

To assist in developing cost estimates, Supply Management provides material and logistics-related cost estimates based on a preliminary bill of material developed by the Project Team.

K. Estimating

Upon receipt of input from the above subject matter experts, a comprehensive estimate is developed incorporating the various teams' analyses. The estimating team works with the subject matter experts to identify potential risks and their potential for occurrence. The results are factored into the project cost estimate.

VIII. ALTERNATIVE DESIGNS

A. Overview

As part of developing the Line 1600 Test or Replacement Plan, SDG&E and SoCalGas considered four alternative designs. The alternative designs were evaluated consistent with the requirements set forth in D.18-06-028 and the overarching objectives of SDG&E and SoCalGas' PSEP to: (1) comply with the Commission's directives; (2) enhance public safety; (3) minimize customer impacts; and (4) maximize the cost effectiveness of safety investments. Engineering factors associated with the unique characteristics of existing Line 1600 were also central to the evaluation. The alternative designs that were considered but not selected include:

- Full hydrostatic strength testing (hydrotesting) of the entire length of Line 1600. Referenced as Line 1600 Full Hydrotest Alternative, or “Full Hydrotest.”
- Full replacement of all vintage sections of Line 1600 in existing streets near Line 1600, with a derate of existing Line 1600 in the north. Includes a pressure reduction of existing Line 1600 in the north to distribution pressure. Referenced as Line 1600 Full Replacement Alternative A – Nearby Streets, or “Full Replacement Nearby Streets.”
- Full replacement of all vintage sections of Line 1600 using Old Highway 395 in the north and nearby streets in the south. Includes a pressure reduction of existing Line 1600 in the north to distribution pressure. Referenced as Line 1600 Full Replacement Alternative B – Hwy 395 North, Nearby Streets South, or “Full Replacement Hwy 395.”

Information regarding these three alternative designs is presented below.

B. Full Hydrotest Alternative

As required under D.18-06-028, SDG&E and SoCalGas considered performing a full hydrostatic test of the entire approximately 50-mile length of Line 1600 as one design alternative. A map of the scope of work associated with the Full Hydrotest alternative design is presented below in Figure 4. In evaluating this alternative, SDG&E and SoCalGas considered the technical aspects of how the entirety of Line 1600 could be hydrotested. The evaluation also considered gas supply to local distribution customers during testing of individual pipeline segments of Line 1600 that is necessary to minimize customer impacts.

The preliminary loaded and escalated cost estimate of the Full Hydrotest alternative based on high level scoping of this work is approximately \$325 million. Of the total estimated loaded and escalated cost, SDG&E and SoCalGas anticipate recording approximately \$92 million as a capital expense and approximately \$233 million as an operating expense. SDG&E and SoCalGas developed a project schedule that factors in time for detailed planning, engineering, and permitting activities, as well as time for construction and testing. This conceptual schedule

is presented below in Figure 5. A corresponding annual spending forecast is presented in Tables 12a and 12b.

Figure 4: Full Hydrotest Alternative

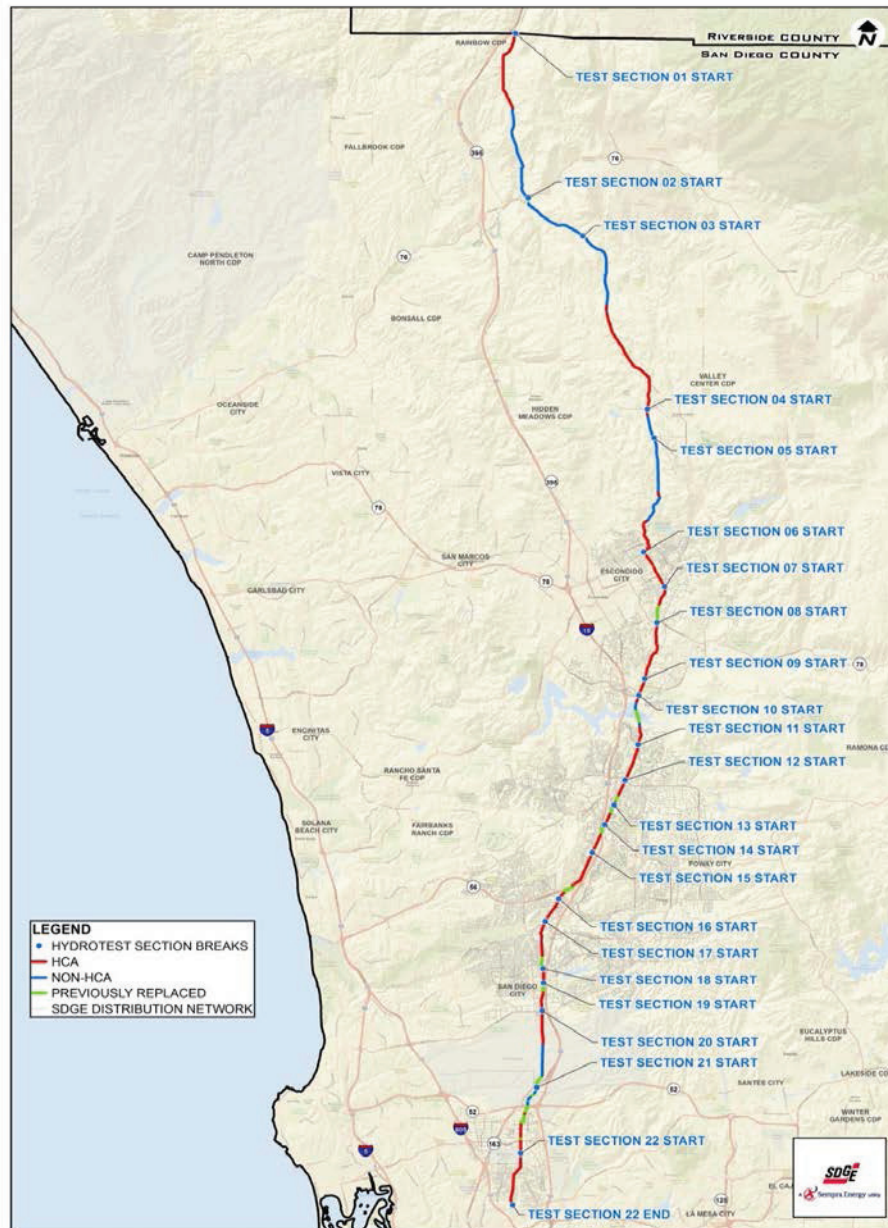
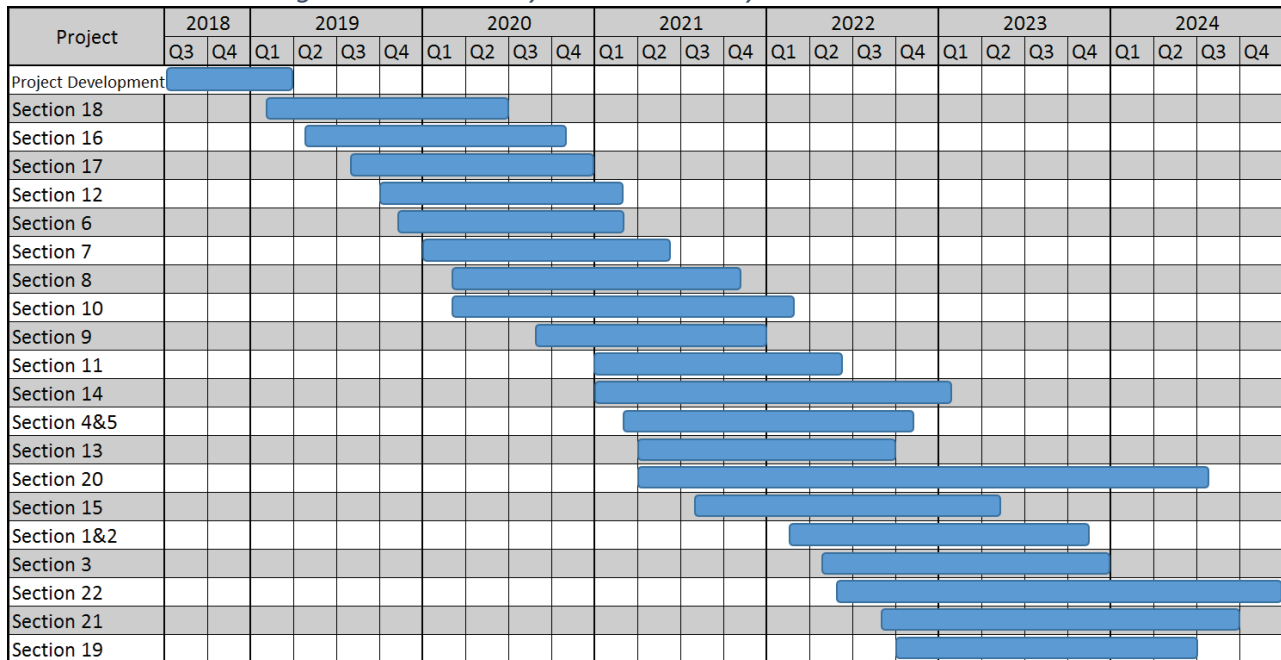


Figure 5: Preliminary Schedule Full Hydrotest Alternative



Hydrotesting the entirety of Line 1600 presents numerous challenges. Line 1600 supplies gas to approximately 150,000 gas meters, many of which have no alternative supply source if Line 1600 is out of service. There are 62 connections on the line that currently provide service to major communities as well as individual customers, including the military, electric generation, and large industrial customers.

To hydrotest Line 1600, 22 separate tests would need to be performed. The 22 test sections are needed to account for elevation changes and to minimize interruption of service to customers. In addition, the scope and schedule needed to account for the high natural gas demands experienced during the summer months due to electric generation prohibit testing of the northern section during that time period. In order to maintain natural gas service during hydrotesting, a combination of various activities will be needed and include back feeding Line 1600, providing temporary supplies via CNG trailers or NG bottles, LNG supplies, or building bypass pipelines. Adequate work space must be secured for test equipment including test

heads, pumps and water storage tanks. As part of the commitment to make Line 1600 fully piggable, preparation of a test section includes the removal of wrinkle bends, shorter radius bends and elbows, pressure control fittings, and other features that prevent the performance of in-line-inspections to assess the integrity of the legacy pipeline using commercially available CMFL (long seam) smart pigging tools.

Test segments were designed according to elevation restrictions, valve sites, large taps, and accessibility/workspace. The tests range from approximately 2,800 feet to 7.5 miles in length, with the average being approximately two miles. The pipeline would be sectionalized at each large tap or valve using either stopples or the main line block valve and installing temporary bypass lines to serve the large customers or major distribution feeder lines.

Since testing requires a flow path from either the north or the south, only one test can be conducted at a time. It is assumed all test water would be filtered and properly disposed of at the end of each test. Each test segment would take approximately four to six weeks to conduct and assumes a separate construction crew would install bypasses concurrently with the hydrotesting effort. Some segments may take longer depending on the specific scope of work on that particular section and permit conditions. If a section of pipe fails the hydrotest, the leak will need to be located, repairs made, and a new test initiated. This could extend the schedule and result in additional costs.

This alternative design contemplates strength-testing by hydrotest with a minimum test pressure of 960 psig, which is 1.5 times the most recent historical MAOP of 640 psig. This minimum test pressure of 960 psi would be held continuously for at least eight hours. A spike test is also included with each test, raising the pressure approximately 5% for one-half hour at

the beginning of the test. The maximum test pressure would be higher in some cases to accommodate elevation differences and is based on an objective to not exceed 90% SMYS or 1462 psig.

Tables 12a and 12b below summarizes the direct and fully loaded and escalated preliminary cost forecast for the Full Hydrotest alternative.

Table 12a
Direct (\$2018) Full Hydrotest Alternative Preliminary Cost Forecast
(in Millions)

	Cost to Date	2019	2020	2021	2022	2023	2024	Total
Cap	\$ 7	\$ 4	\$ 12	\$ 11	\$ 15	\$ 14	\$ 6	\$ 70
O&M	\$ 18	\$ 11	\$ 32	\$ 30	\$ 41	\$ 38	\$ 16	\$ 186
Total	\$ 26	\$ 15	\$ 44	\$ 41	\$ 56	\$ 52	\$ 22	\$ 256

Table 12b
Loaded and Escalated Full Hydrotest Alternative Preliminary Cost Forecast
(in Millions)

	Cost to Date	2019	2020	2021	2022	2023	2024	Total
Cap	\$ 9	\$ 5	\$ 15	\$ 15	\$ 20	\$ 19	\$ 8	\$ 92
O&M	\$ 23	\$ 13	\$ 39	\$ 37	\$ 51	\$ 49	\$ 21	\$ 233
Total	\$ 33	\$ 18	\$ 54	\$ 52	\$ 71	\$ 68	\$ 29	\$ 325

Following PSEP project evaluation criteria and considering the engineering factors associated with the unique characteristics of the vintage A.O. Smith electric flash welded pipe, SDG&E and SoCalGas determined the Full Hydrotest alternative design is not the best design to pursue. While it is the least expensive, in terms of minimally achieving compliance with Public Utilities Code section 958, it does not resolve long term safety considerations associated with the legacy pipe in populated areas. As discussed earlier in this Plan, these safety considerations, which include lack of fracture control and hook crack anomalies, would remain even if the line

passes the hydrotest. Pressure testing the existing Line 1600 pipeline does not reduce the rupture risk from future mechanical damage, remove sub-critical flaws that may grow or interact with other threats, improve the pipe material's resistance to rupture, or ensure that Line 1600 will remain in transmission service in the future. As such, SDG&E and SoCalGas concluded that the most prudent choice with respect to providing long term safety, reliability and operational benefits is to replace the HCA portions of this legacy pipe. Therefore, the Full Hydrotest alternative design is not proposed by SDG&E and SoCalGas.

C. Full Replacement in Nearby Streets Alternative

SDG&E and SoCalGas also considered performing a full replacement of Line 1600 re-routed in roads and streets near the existing Line 1600. A map of the scope of work associated with the Full Replacement in Nearby Streets alternative design is presented below in Figure 6. The scope of work South of Escondido is identical under the Replace in HCA/Test in Non-HCA, Full Replacement in Nearby Streets and Full Replacement Along Highway 395 alternatives. Because the scope of work South of Escondido is already described above as part of the proposed Plan, this discussion focuses on the scope of work north of Escondido, specifically, the installation of new pipe north of the intersection of Line 1600 and Line 1601, [REDACTED]. This alternative offers the advantage that all 1949-vintage A.O. Smith pipe would be removed from transmission service in both HCAs and non-HCAs, thereby increasing the margin of safety and long-term reliability of the entire pipeline for the benefit of customers. This also provides the opportunity to restore the MAOP of Line 1600 to 800 psig, which matches that of the other transmission pipelines it will interconnect with and would allow Line 1600 to provide greater benefit in the event of an outage or pressure reduction on Line 3010. SDG&E and

SoCalGas' plan would be to operate so as not to exceed the capacity requirement of the Commission Decision, even though the line would be constructed and tested to allow for the potential to operate at an MAOP of 800 psig.

This alternative includes a pressure reduction and conversion of the old Line 1600 to 60 psig distribution pressure from Rainbow Station in the north to the intersection with Line 1601 in [REDACTED], thereby eliminating the need for installation of long runs of smaller diameter pipe between the new Line 1600 and the existing old Line 1600.

The Full Replacement in Nearby Streets route requires approximately 56 miles of 16-inch pipeline, as follows:

- Install 25 miles of 16-inch diameter pipe from Rainbow Station to Line 1601.
- Install 31 miles of 16-inch diameter pipe from Line 1601 to Mission Station.

The route involves installation along several narrow, winding, and rocky San Diego County roads, including Rainbow, Rice Canyon, Couser Canyon, Lilac, and Valley Center Roads. The southern terminus of this route is within the jurisdiction of the City of Escondido, with pipe installation in relatively high-traffic volume city streets. A minimum of three (3) jack-and-bore³⁸ installations and two (2) horizontal directional drill installations³⁹ would be required. Due to the narrow county roads with widespread potential for rock in the trench line, construction experts anticipate some of the lowest rates of production along these roads, which is expected to

³⁸ Jack-and-bore is a form of installation that enables construction crews to drill a horizontal hole underground between two points without disturbing the surface between the sending and receiving excavation pits. This method of drilling is costlier than a standard open trench method, and may be necessary to address anticipated site conditions, such as adjacent facilities, and/or permitting requirements.

³⁹ Horizontal Directional Drilling is a trenchless method of construction. Like jack-and-bore, this construction method is costlier than a standard open trench method, but may be necessary to address anticipated site conditions, such as adjacent facilities, and/or permitting requirements.

increase overall construction costs. For this reason, the Full Replacement in Nearby Streets alternative route is estimated to be the costliest of the full replacement alternatives, at a capital cost of \$778 million (loaded and escalated). SDG&E and SoCalGas developed a preliminary schedule that factors in time for detailed planning, engineering, and permitting activities, as well as time for construction and post-construction testing. This preliminary schedule is presented below in Figure 7. A corresponding annual spending forecast is presented in Table 13.

Figure 6: Full Replacement in Nearby Streets Alternative

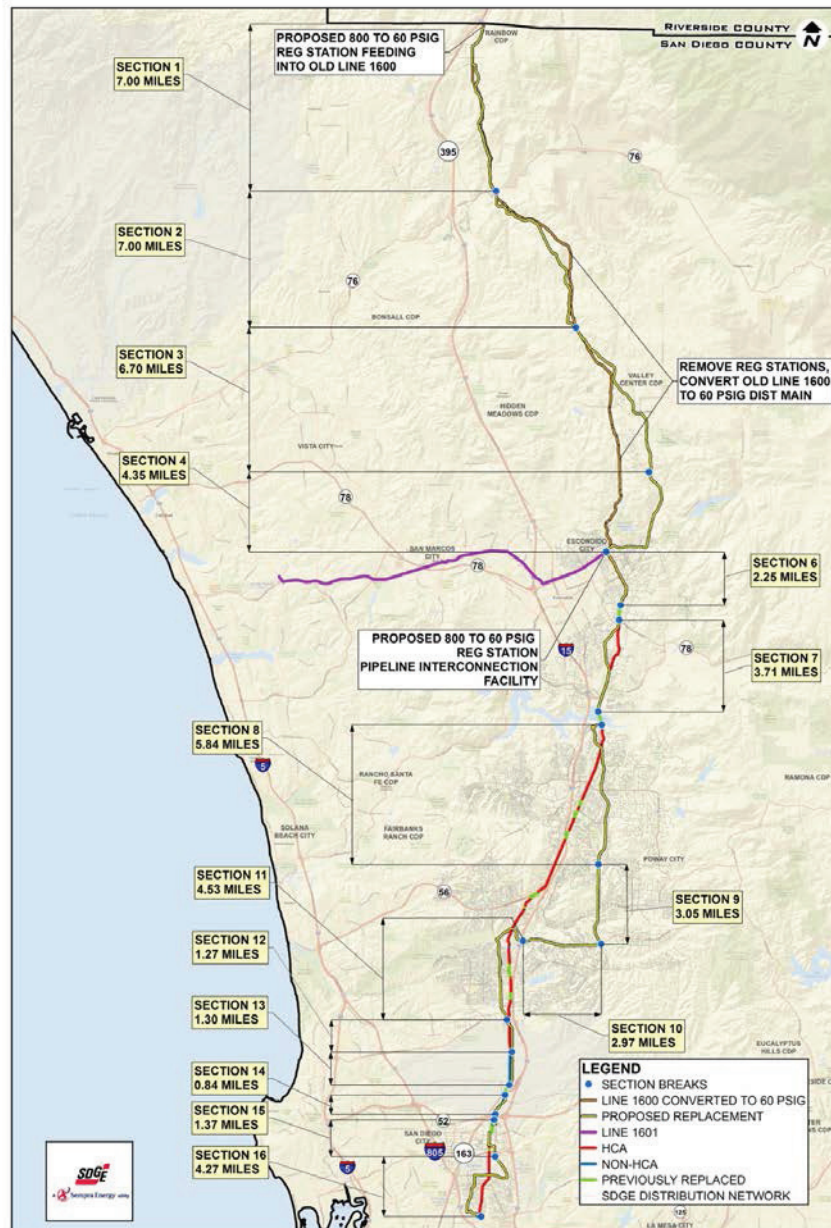
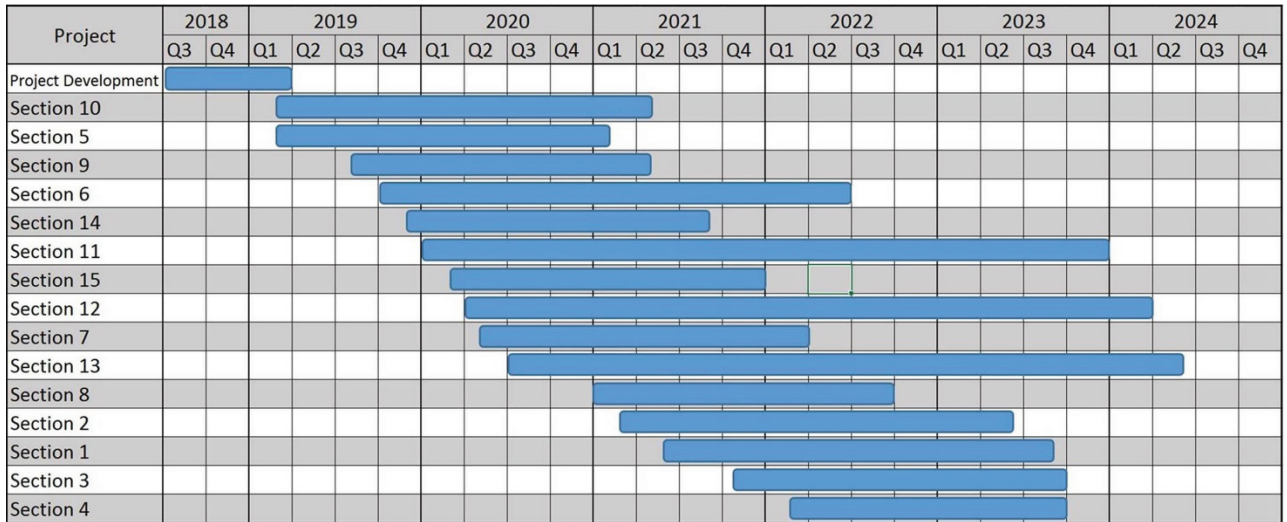


Figure 7: Preliminary Schedule for Full Replacement in Nearby Streets Alternative



The Full Replacement in Nearby Streets alternative is considered a viable and beneficial design alternative in that full replacement of the existing 1949 vintage A.O. Smith pipe enhances safety, improves reliability, and eliminates certain operations and maintenance difficulties.

Benefits are summarized below:

- Replacement of 1949 A.O. Smith pipe in non-HCA areas enhances the safety margin in such areas. Although such areas do not fall within the High Consequence Area definition under federal regulations, failure of a natural gas pipeline in non-HCAs still poses risks to people, society and the environment.
- Full replacement of 1949 A.O. Smith pipe in Line 1600 ensures that Line 1600 will remain capable of transmission service in the foreseeable future. The SDG&E natural gas transmission system relies on Line 3010 and Line 1600 to provide reliable service. Line 1600's capacity allows planned maintenance outages or pressure reductions on Line 3010. In the event of an unplanned outage or pressure reduction on Line 3010, Line 1600 provides capacity to maintain gas service to some or all customers, depending upon gas demand at the time.
- Full replacement of 1949 A.O. Smith pipe in Line 1600 would allow the restoration of an 800 psig MAOP on Line 1600, thus enhancing reliability of service to customers.
- Replacement of 1949 A.O. Smith pipe in non-HCAs eliminates the need to cut out pipeline components that are not piggable with CMFL (long seam) inline inspection tools (*e.g.*, shorter radius elbows and certain bend geometries), thereby enhancing

the ability of SDG&E and SoCalGas to assess and maintain the integrity of the pipeline. Many of these cutouts are in environmentally sensitive areas that require long-lead permitting.

- Elimination of hydrotests of 1949 vintage pipe in non-HCAs reduces the risk of environmental damage due to a hydrotest failure in environmentally sensitive areas of north San Diego county, as compared to the Full Hydrotest and Replace in HCA/Test in Non-HCAs alternatives. Hydrotest options, by necessity, require testing of a pipeline at a pressure much higher than the operating pressure.

As depicted in Tables 13a and 13b below, the Full Replacement in Nearby Streets alternative is the most costly alternative considered.

Table 13a
Direct (\$2018) Full Replacement in Nearby Streets Preliminary Cost Forecast
(in Millions)

	Cost to Date	2019	2020	2021	2022	2023	2024	Total
Cap	\$ 26	\$ 30	\$ 113	\$ 184	\$ 188	\$ 81	\$ 2	\$ 623
O&M	-	-	-	-	-	-	-	-
Total	\$ 26	\$ 30	\$ 113	\$ 184	\$ 188	\$ 81	\$ 2	\$ 623

Table 13b
Loaded and Escalated Full Replacement in Nearby Streets Preliminary Cost Forecast
(in Millions)

	Cost to Date	2019	2020	2021	2022	2023	2024	Total
Cap	\$ 33	\$ 35	\$ 138	\$ 228	\$ 237	\$ 105	\$ 2	\$ 778
O&M	-	-	-	-	-	-	-	-
Total	\$ 33	\$ 35	\$ 138	\$ 228	\$ 237	\$ 105	\$ 2	\$ 778

Consistent with the overarching PSEP objective to maximize the cost effectiveness of safety enhancement investments for the benefit of customers, SDG&E and SoCalGas do not propose the Full Replacement in Nearby Streets alternative due to the higher costs of construction, and lack of discernible safety enhancement advantage above the Full Replacement in Highway 395 alternative described below.

D. Full Replacement Along Highway 395 Alternative

Lastly, SDG&E and SoCalGas considered performing a full replacement of Line 1600 in franchise roads and streets predominantly using old Highway 395 from Rainbow Station to the intersection of Line 1601 in Escondido at [REDACTED]. A map of the scope of work associated with the Full Replacement Along Highway 395 alternative design is presented below in Figure 8. As this design alternative is identical to the proposed Plan south of Escondido, the focus of this explanation is the pipe installation north of Escondido, specifically north of the intersection of [REDACTED] at Line 1601.

Like the Full Replacement in Nearby Streets alternative, the Full Replacement Along Highway 395 alternative offers the advantage that all vintage 1949 A.O. Smith pipeline would be removed from transmission service in both HCAs and non-HCAs, thereby increasing the margin of safety and long-term reliability of the entire pipeline for the benefit of customers. This also provides the opportunity to restore the MAOP of Line 1600 to 800 psig, which matches that of the other transmission pipelines with which it will interconnect.

This alternative includes a pressure reduction of the existing Line 1600 to distribution pressure from Rainbow Station in the north to the intersection with Line 1601 in Escondido at [REDACTED], eliminating the need for installation of long runs of smaller-diameter pipe between the new Line 1600 and the existing old Line 1600.

Installation along the Highway 395 Route requires approximately 57 miles of new large diameter pipeline, as follows:

- Install 24 miles of 16-inch pipe from Rainbow Station to Line 1601.
- Install 31 miles of 16-inch pipe from Line 1601 to Mission Station.

- Install two (2) miles of 10-inch from I-15 tie-in to Rice Canyon tie-in to the existing 10-inch diameter transmission level pressure pipeline that feeds the [REDACTED] electric generating station along Highway 76.
- Tie-in to and utilize two (2) miles of existing 16-inch Line 1601 from [REDACTED] [REDACTED]. No hydrotest required.

The route requires installation across a small number of agricultural and undeveloped parcels within the jurisdiction of San Diego County. The southern terminus of this northern route section is within the jurisdiction of the City of Escondido, with pipe installation located down relatively high-volume city streets. A minimum of six (6) jack-and-bore installations are required, and one (1) horizontal directional drill installation is required. However, the majority of the replacement is within relatively open, wide, and low-traffic density roadways in the North County. Therefore, construction experts anticipate achieving some of the highest rates of production in these sections, which translates into improved cost efficiency overall for this option. For this reason, the Highway 395 Route is estimated to be the lowest cost of the full replacement design alternatives, at a capital cost of \$725 million (loaded and escalated). SDG&E and SoCalGas developed a preliminary schedule that factors in time for detailed planning, engineering, and permitting activities, as well as time for construction and post-construction testing. This conceptual schedule is presented below in Figure 9. A corresponding annual spending direct and fully loaded and escalated forecast is presented in Table 14a and 14b below.

Figure 8: Full Replacement Along Highway 395 Alternative

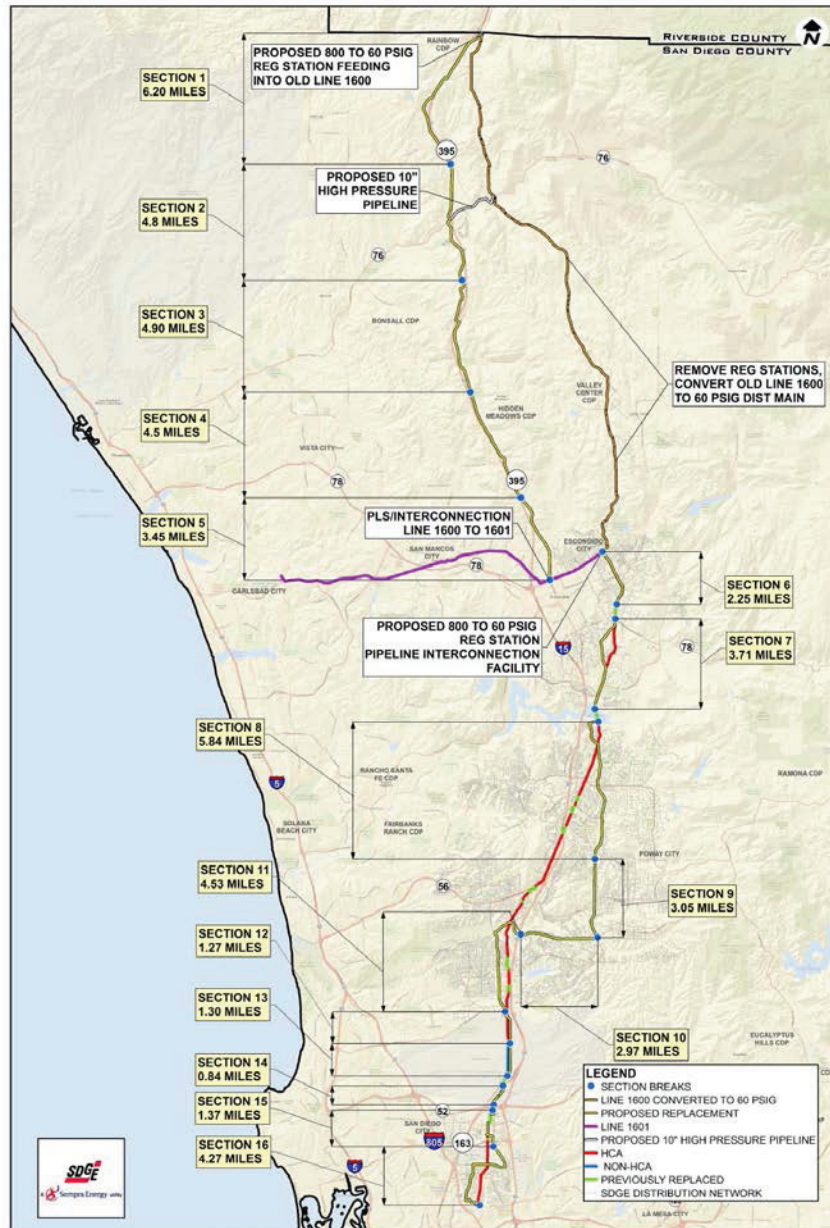
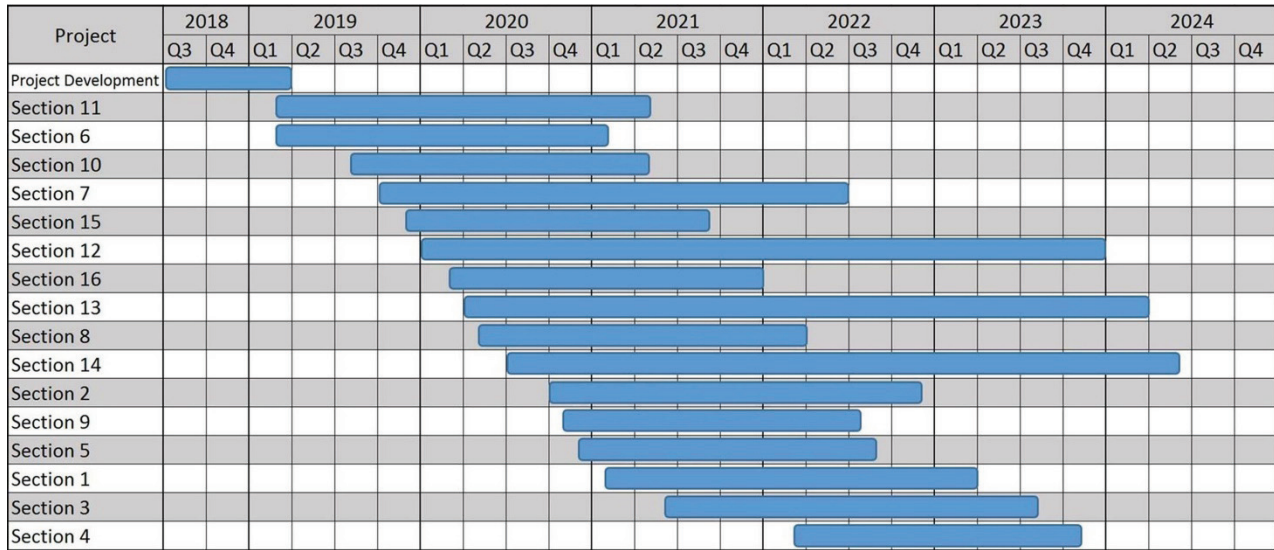


Figure 9: Preliminary Schedule Full Replacement Along Highway 395 Alternative



The Full Replacement Along Highway 395 alternative is considered a viable and beneficial design alternative in that full replacement of the existing 1949 vintage A.O. Smith pipe enhances safety, improves reliability, and eliminates certain operations and maintenance difficulties.

These benefits are summarized as follows:

- Replacement of 1949 A.O. Smith pipe in non-HCAs enhances the margin of safety in those areas.
- Full replacement of all Line 1600 1949 A.O. Smith pipe enables Line 1600 to continue to provide reliable transmission service in the foreseeable future. The SDG&E natural gas transmission system relies on Line 3010 and Line 1600 to provide reliable service. Line 1600's capacity allows planned maintenance outages or pressure reductions on Line 3010. In the event of an unplanned outage or pressure reduction on Line 3010, Line 1600 provides capacity to maintain gas service to some or all customers, depending upon gas demand at the time. Full replacement of 1949 A.O. Smith pipe in Line 1600 would allow SDG&E and SoCalGas to potentially restore an 800 psig MAOP on Line 1600, with Commission approval, thus returning the full operational capability to serve customers.
- Replacement of 1949 A.O. Smith pipe in non-HCAs eliminates the need to cut out pipeline components that are not piggable with CMFL (long seam) in-line inspection tools (*e.g.*, shorter radius elbows and certain bend geometries), thereby enhancing the ability of SDG&E and SoCalGas to assess and maintain the integrity of the pipeline.

Many of these cutouts are in environmentally sensitive areas that may require long-lead permitting.

- Elimination of hydrotests of 1949 vintage pipe in non-HCAs reduces the risk of environmental damage due to a hydrotest failure in environmentally sensitive areas of north San Diego county, as compared to the Full Hydrotest and Replace in HCA/Test in Non-HCA alternative. Compliant hydrotests, by nature, require testing of a pipeline at a pressure much higher than the operating pressure.
- Installation along Highway 395, which parallels much of Interstate 15, enhances accessibility to the pipeline for maintenance or in the event of an emergency.
- Highway 395 is a wider road than the roads associated with the northern sections of the Full Replacement in Nearby Streets alternative and thus provides more working space during construction and maintenance, which results in less disruption to the community. Local communities are anticipated to be less affected by the Highway 395 route due to more effective traffic flow, thus causing only moderate traffic delays.
- Relatively wide, open roadways are expected to increase rates of production for this route, resulting in reduced installation cost.

SDG&E and SoCalGas recognize the value of full replacement along the Highway 395

Route, which include:

- 1) Increased safety margins in non-HCAs;
- 2) Enhanced reliability of the SDG&E natural gas transmission system;
- 3) Elimination of the challenges of acquiring specialized integrity assessment equipment to complete in-line inspections of Line 1600;
- 4) Reduced risk of hydrotest failures in non-HCAs;
- 5) Enhanced access to the pipeline for operations and maintenance of the new pipeline, thereby increasing safety and reducing future operations and maintenance costs;
- 6) Reduced construction burden on nearby communities compared to the Full Replacement in Nearby Streets alternative; and
- 7) Full and safe restoration of Line 1600's transmission function using modern materials, construction methods and safety features.

Table 14a
Direct (\$2018) Full Replacement Along Highway 395 Preliminary Cost Forecast
(in Millions)

	Cost to Date	2019	2020	2021	2022	2023	2024	Total
Cap	\$ 26	\$ 31	\$ 134	\$ 195	\$ 131	\$ 61	\$ 2	\$ 580
O&M	-	-	-	-	-	-	-	-
Total	\$ 26	\$ 31	\$ 134	\$ 195	\$ 131	\$ 61	\$ 2	\$ 580

Table 14b
Loaded and Escalated Full Replacement Along Highway 395 Preliminary Cost Forecast
(in Millions)

	Cost to Date	2019	2020	2021	2022	2023	2024	Total
Cap	\$ 33	\$ 38	\$ 164	\$ 243	\$ 167	\$ 79	\$ 2	\$ 725
O&M	-	-	-	-	-	-	-	-
Total	\$ 33	\$ 38	\$ 164	\$ 243	\$ 167	\$ 79	\$ 2	\$ 725

Compared to the cost of the Replace in HCA/Test in Non-HCA alternative proposed, the loaded and escalated incremental cost to replace all the vintage A.O. Smith pipe is anticipated to be approximately \$48 million. Although this design alternative offers the greatest safety enhancement benefits for a modest 7% increase in cost, SDG&E and SoCalGas do not propose this alternative.

IX. POTENTIAL PLAN MODIFICATIONS

As explained above, SDG&E and SoCalGas anticipate that the scope and schedule for each testing and replacement project section in this Plan will be refined over time as SDG&E and SoCalGas complete the detailed engineering, design and planning work necessary to safely complete the testing and replacement projects as soon as practicable. As with all Phase 1 PSEP projects, changes in scope that impact the schedule of a Line 1600 test or replacement project

will be reflected in the PSEP status reports submitted to SED and Energy Division on a monthly basis under D.12-04-021.

In the event that additional information or conditions are identified during implementation of this Plan which lead SDG&E and SoCalGas to conclude that it would be more prudent to replace a project section currently identified for pressure testing, SDG&E and SoCalGas propose to submit a revised Replacement plan for that section to SED for review and concurrence with the change in scope. Circumstances that could lead to such changes in scope may include: (1) receipt of new information regarding the condition or integrity of a pipeline section currently identified for pressure testing that indicates replacement would be a more prudent safety enhancement investment for customers; (2) changes in non-HCA status, land use regulations, or development within a pressure-test segment; and (3) identification of customer impacts that cannot be cost-effectively mitigated through the means described above in Section IV.F.

X. APPENDIX

A. Maps of Replace in HCA/Test in Non-HCA Alternative

Figure 10
Replace in HCA/Test in Non-HCA Overview Map

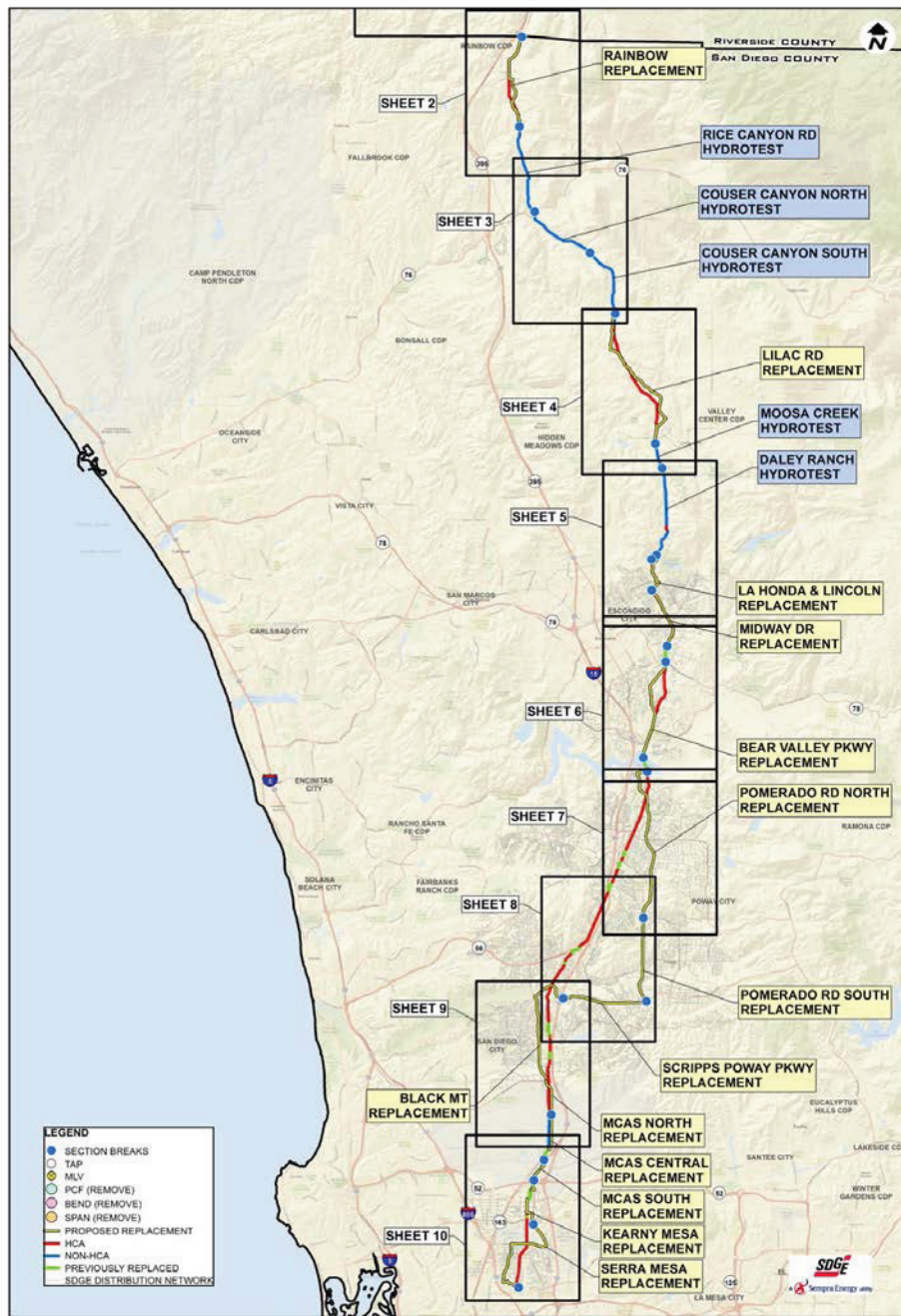


Figure 11
Replace in HCA/Test in Non-HCA Detail Map

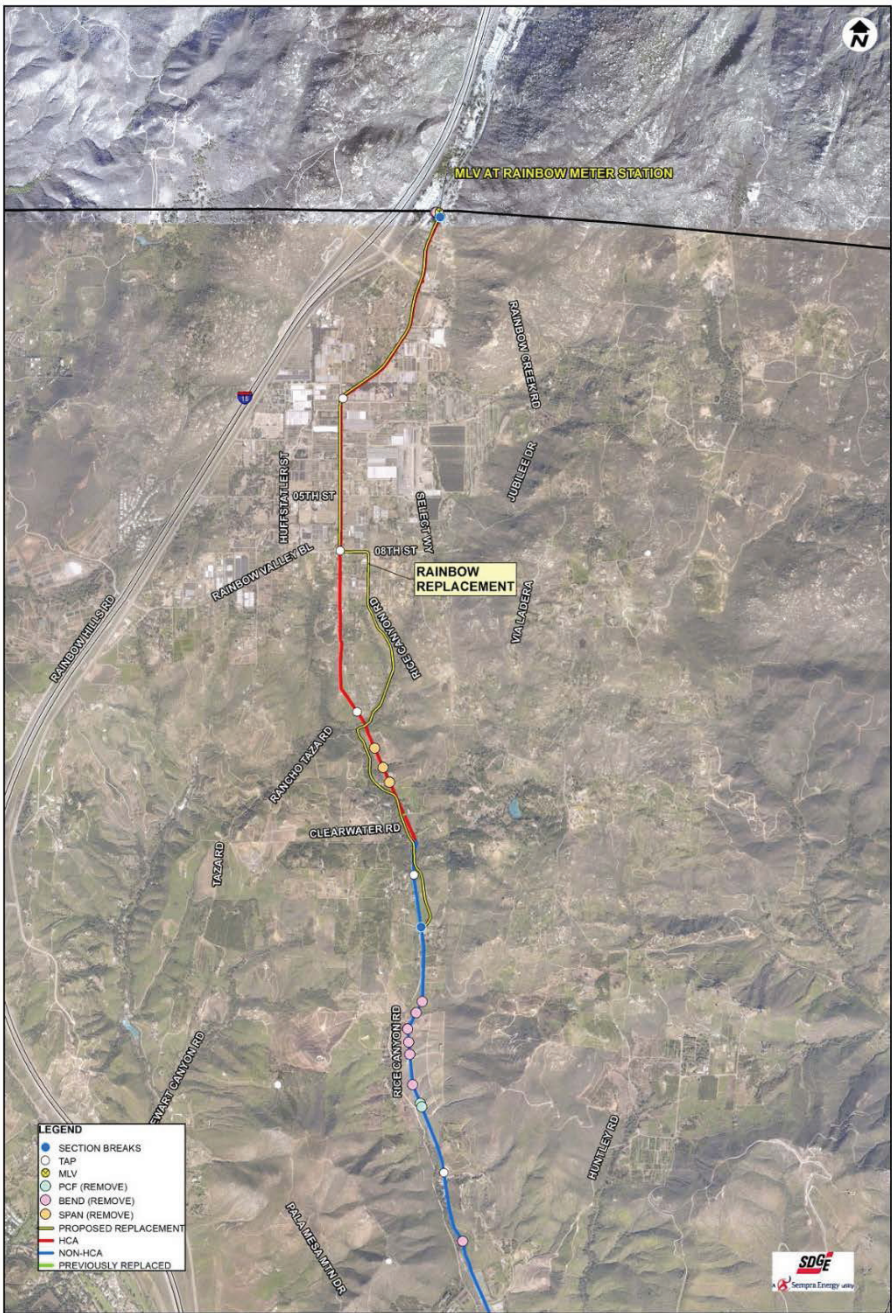


Figure 12
 Replace in HCA/Test in Non-HCA Detail Map

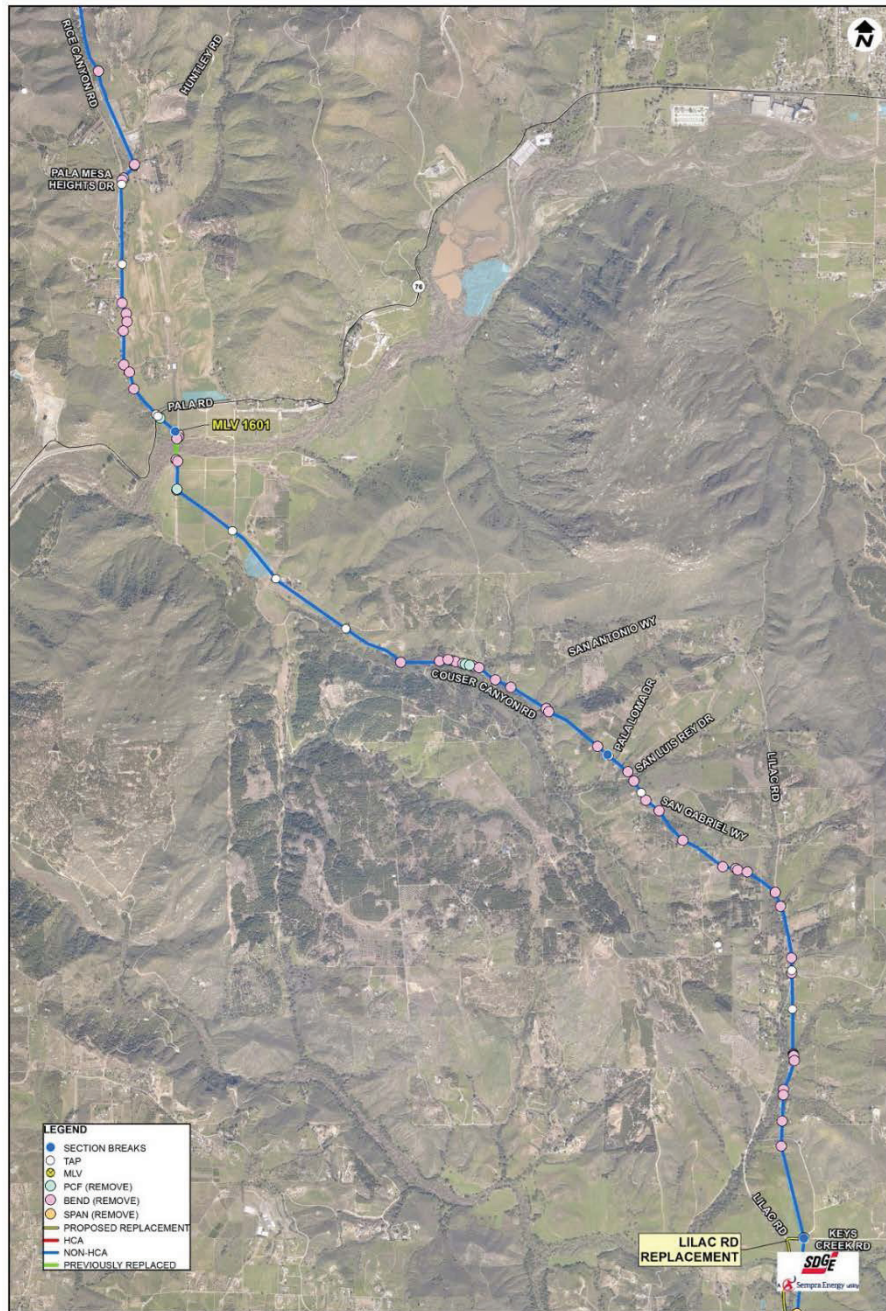


Figure 13
Replace in HCA/Test in Non-HCA Detail Map

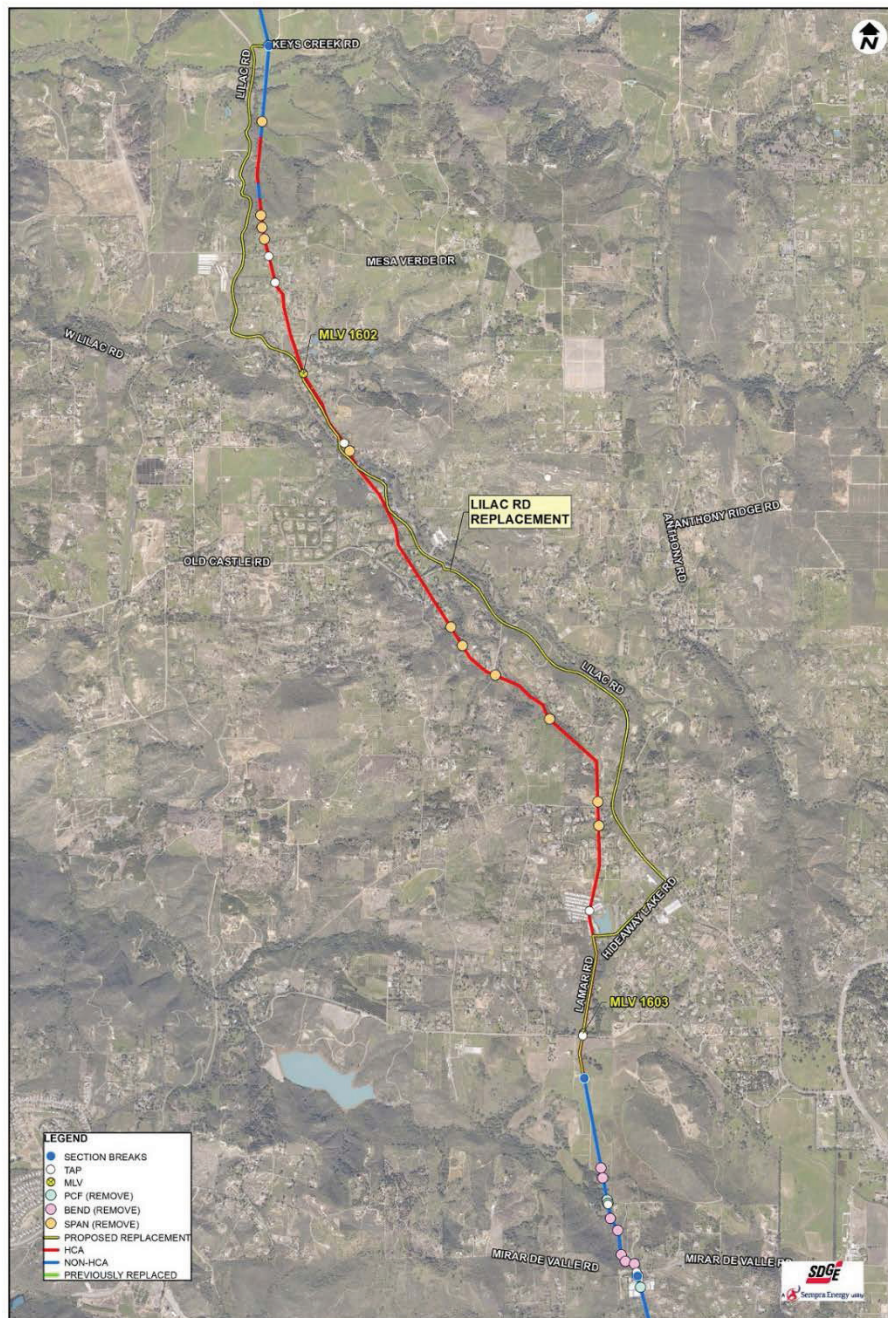


Figure 14
Replace in HCA/Test in Non-HCA Detail Map

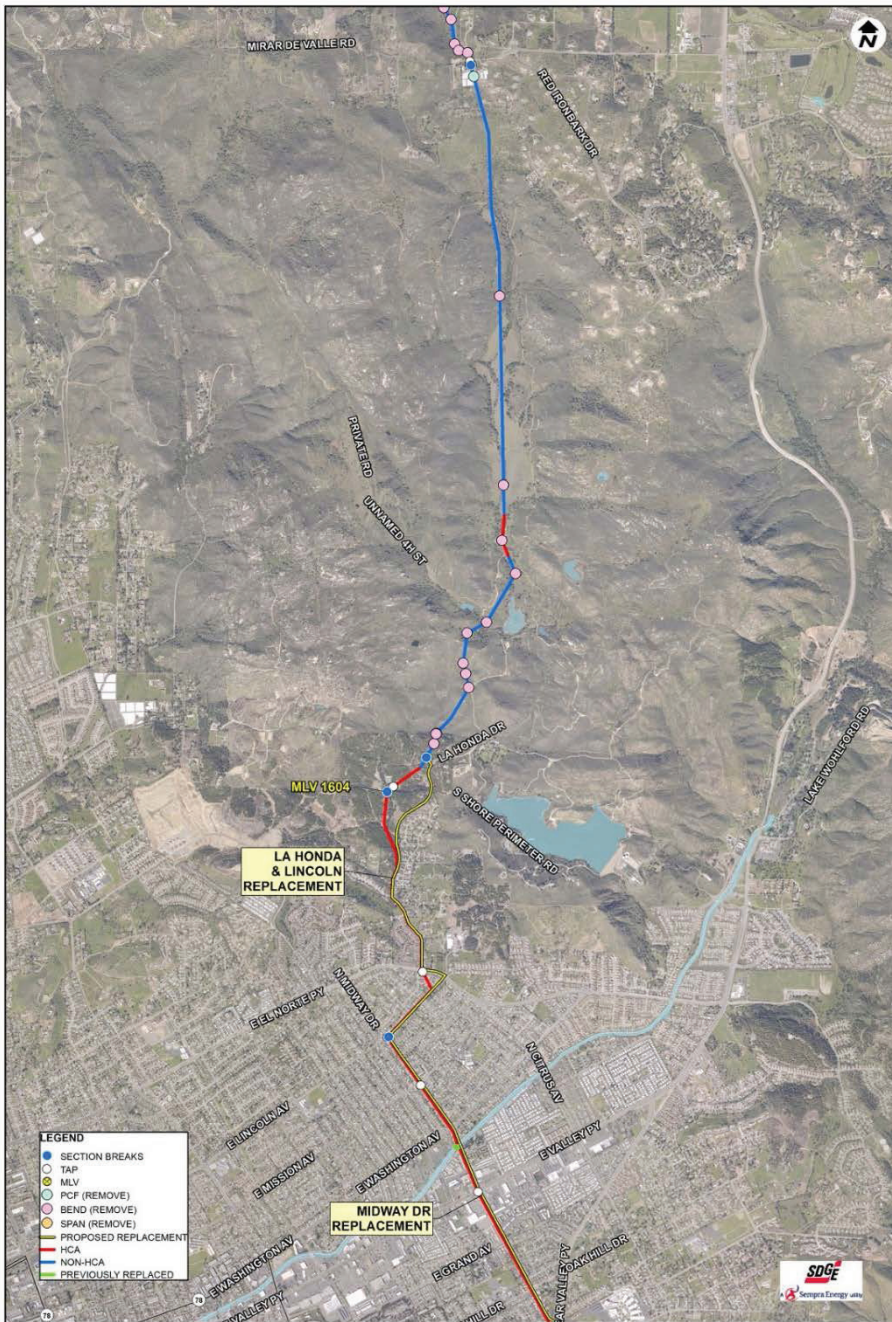


Figure 15
Replace in HCA/Test in Non-HCA Detail Map



Figure 16
Replace in HCA/Test in Non-HCA Detail Map

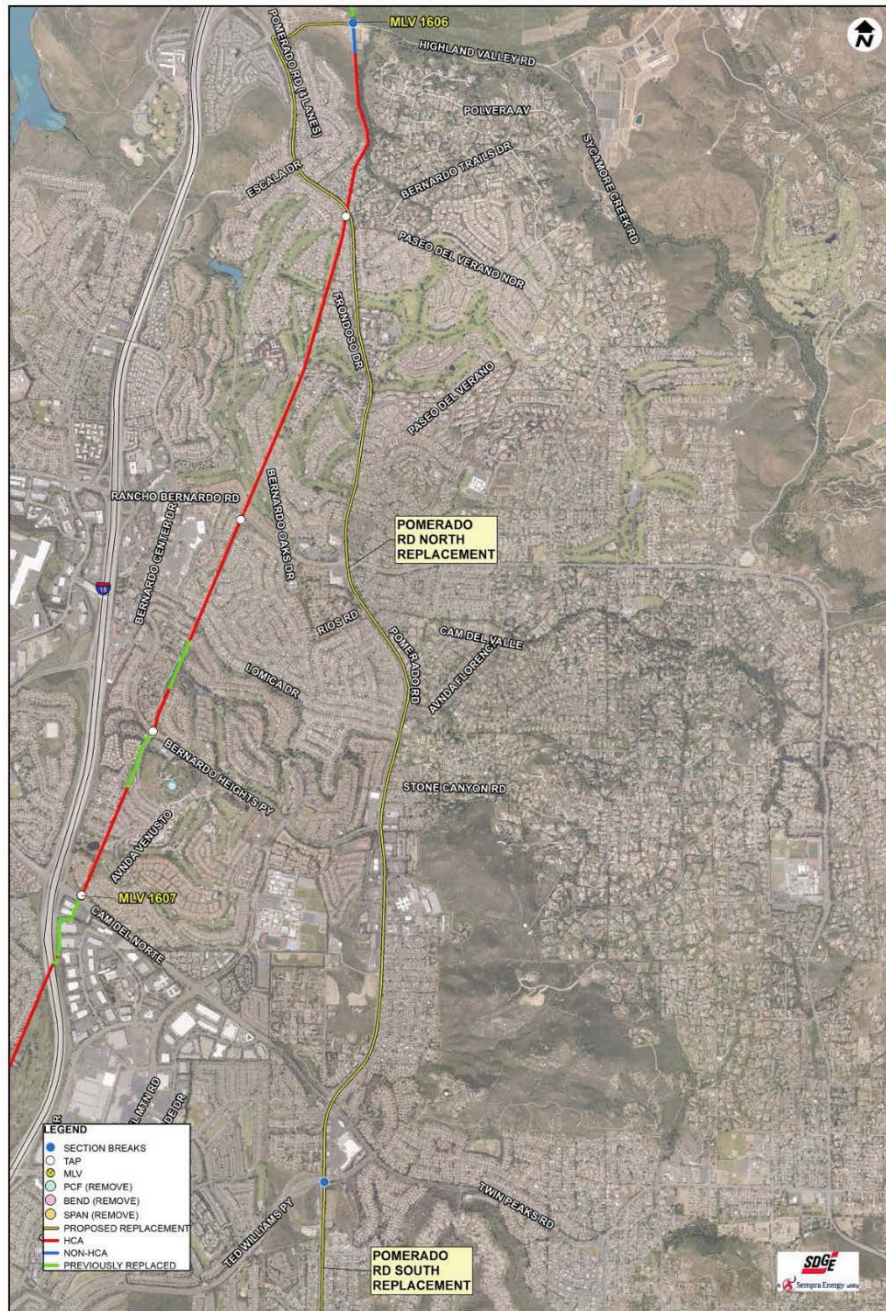


Figure 17
 Replace in HCA/Test in Non-HCA Detail Map



Figure 18
Replace in HCA/Test in Non-HCA Detail Map

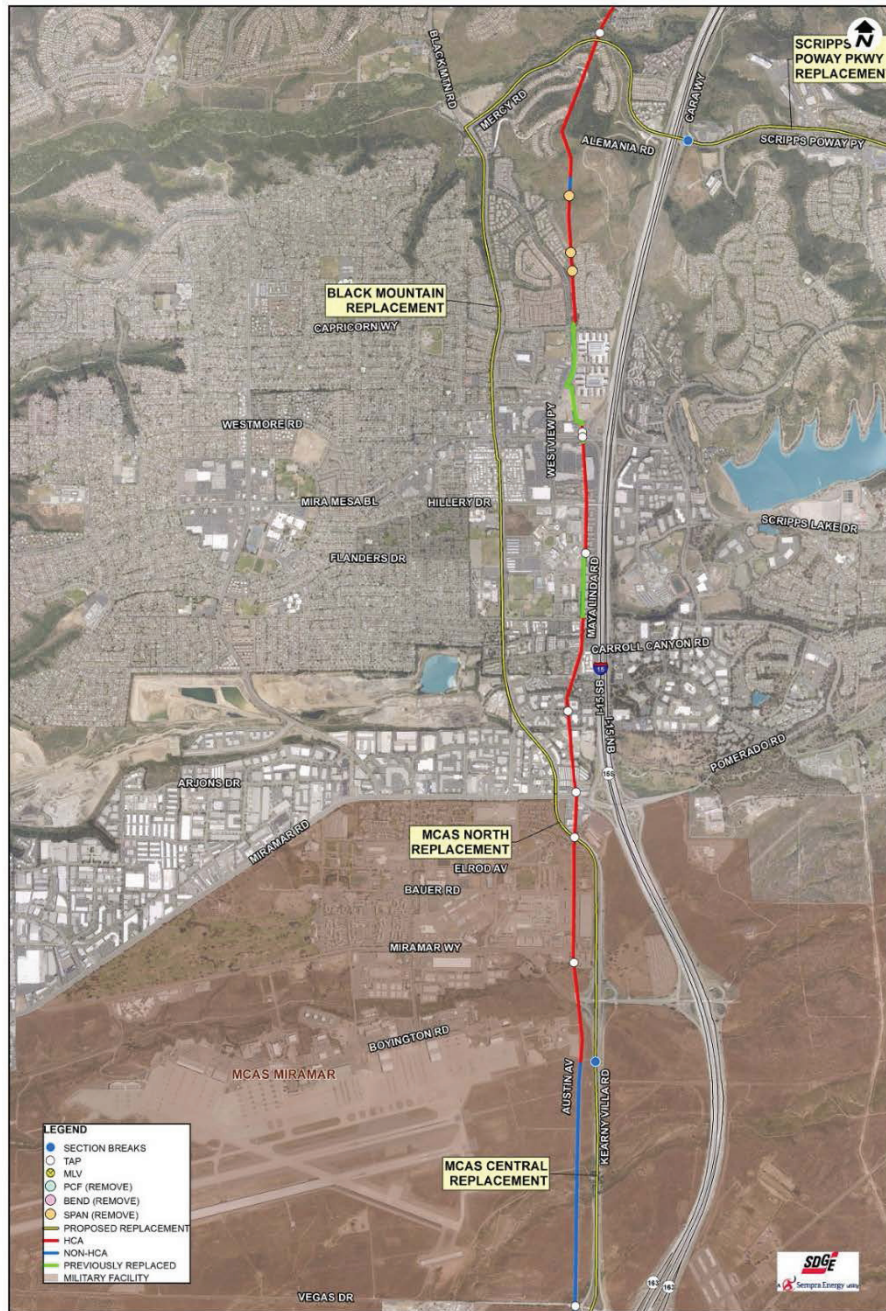


Figure 19
Replace in HCA/Test in Non-HCA Detail Map



B. Illustrative Photographs of Nearby Street Route for Replacement Pipe

Figure 20

(Rainbow Replacement Section)



Figure 21

(Rainbow Replacement Section)



Figure 22

(Lilac Road Replacement Section)



Figure 23

(Midway Drive Replacement Section)



Figure 24

(Bear Valley Replacement Section)



Figure 25

(Pomerado Road North Replacement Section)



Figure 26

(Scripps Poway Parkway Replacement Section)



Figure 27

[REDACTED]
(Black Mountain Replacement Section)



Figure 28

(Black Mountain Replacement Section)



Figure 29

(MCAS Central Replacement Section)



Figure 30

(MCAS South Replacement Section)



Figure 31

(Kearny Mesa Replacement Section)



Figure 32

(Sera Mesa Replacement Section)



Figure 33

(Sera Mesa Replacement Section)



C. Illustrative Photographs of Existing Line 1600 Right-of-Way

Figure 34
Approximately [REDACTED]



Figure 35



Figure 36



Figure 37
Existing Line Near [REDACTED]



Figure 38

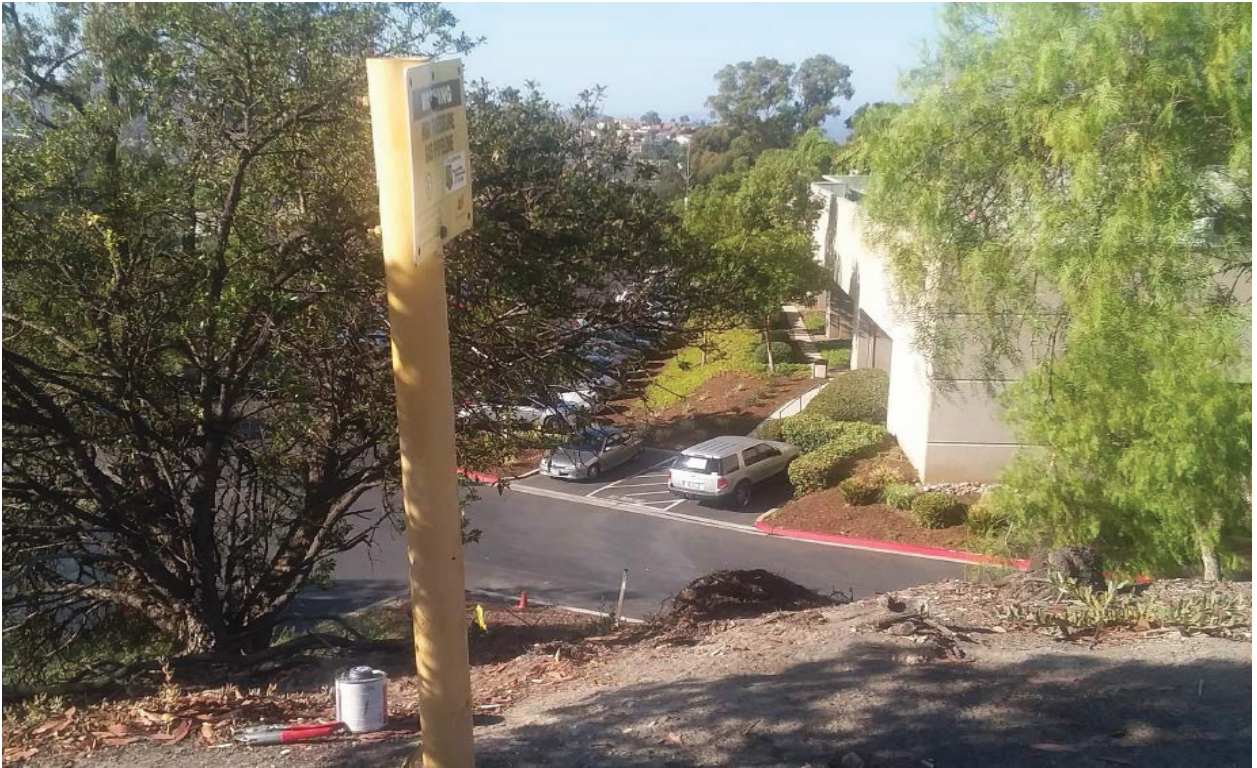


Figure 39

Near [REDACTED]



Figure 40

Near [REDACTED]



Figure 41



Figure 42



Figure 43



D. SDG&E and SoCalGas Compliance with Applicable State and Federal Regulations

Table 15

SDG&E and SoCalGas Compliance with Applicable State and Federal Regulations					
Code	Section	Title	Requirement	Meet or Exceed	If exceeding, how?
CPUC General Order 112-F					
Subpart B-REPORTS	122	Gas Incident Reports		Meet	
Subpart B-REPORTS	123	Annual Reports		Meet	
Subpart B-REPORTS	124	Reporting Safety – Related Conditions		Meet	
Subpart B-REPORTS	125	Proposed Installation Report		Meet	
49 Code of Federal Regulations Part 191					
Reports	§191.5	Immediate notice of certain incidents		Meet	
Reports	§191.7	Report submission requirements		Meet	
Reports	§191.15	Transmission systems; gathering systems; and liquefied natural gas facilities: Incident report		Meet	
Reports	§191.17	Transmission systems; gathering systems; and liquefied natural gas facilities: Annual report		Meet	
Reports	§191.23	Reporting safety-related conditions		Meet	
Reports	§191.25	Filing safety- related condition reports		Meet	
49 Code of Federal Regulations Part 192					
Subpart A - GENERAL	192	General		Meet	
Subpart B – MATERIALS	§192.53	General		Meet	

SDG&E and SoCalGas Compliance with Applicable State and Federal Regulations					
Code	Section	Title	Requirement	Meet or Exceed	If exceeding, how?
Subpart B – MATERIALS	§192.55	Steel pipe	Comply with American Petroleum Institute's (API) 5L "Specification for Line Pipe." The required minimum average absorbed energy for each full size specimens is 20 ft- lbs.	Exceed	SDG&E and SoCalGas will exceed API5L by requiring pipe impact toughness greater than 29 ft- lbs. for 12" diameter pipe and a more stringent chemical composition to comply with qualified welding procedures.
Subpart B – MATERIALS	§192.65	Transportation of pipe	Comply with API5L recommended practice RP5L1 and RP5LW	Exceed	SDG&E and SoCalGas also require compliance with API recommended practice RP5LT for Truck Transportation of Line Pipe
Subpart C –PIPE DESIGN	§192.103	General		Meet	
Subpart C –PIPE DESIGN	§192.105	Design formula for steel pipe		Meet	
Subpart C –PIPE DESIGN	§192.109	Nominal wall thickness (t) for steel pipe		Meet	

SDG&E and SoCalGas Compliance with Applicable State and Federal Regulations					
Code	Section	Title	Requirement	Meet or Exceed	If exceeding, how?
Subpart C –PIPE DESIGN	§192.111	Design factor (F) for steel pipe	Classes 1, 2, 3 and 4 locations require 0.72, 0.6 0.5, 0.4 Design Factors, respectively.	Exceed	A 0.4 Design Factor, which is only required in Class 4 locations, will be used for all locations where new pipe is installed, resulting in significantly higher safety factors than required in Class 1,2, and 3 locations.
Subpart C –PIPE DESIGN	§192.115	Temperature De-rating Factor (T) for Design of Steel Pipe		Meet	
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.143	General requirements		Meet	
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.144	Qualifying metallic components		Meet	
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.145	Valves		Meet	
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.147	Flanges and flange accessories		Meet	
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.150	Passage of internal inspection devices		Meet	

SDG&E and SoCalGas Compliance with Applicable State and Federal Regulations					
Code	Section	Title	Requirement	Meet or Exceed	If exceeding, how?
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.153	Components fabricated by welding		Meet	
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.155	Welded branch connections		Meet	
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.159	Flexibility		Meet	
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.161	Supports and anchors		Meet	
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.163	Compressor stations: Design and construction		N/A	
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.165	Compressor stations: Liquid removal		N/A	
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.167	Compressor stations: Emergency shutdown		N/A	
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.169	Compressor stations: Pressure limiting devices		N/A	
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.171	Compressor stations: Additional safety equipment		N/A	

SDG&E and SoCalGas Compliance with Applicable State and Federal Regulations					
Code	Section	Title	Requirement	Meet or Exceed	If exceeding, how?
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.173	Compressor stations: Ventilation		N/A	
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.179	Transmission line valves	The required Spacing between Main Line Valves is 20 miles in Class 1, 15 miles for Class 2, and 8 miles for Class 3 locations. Each section of a transmission line must have a blow down valve with enough capacity to blow down a line as rapidly as practicable	Exceed	The pipeline is designed to have 5-mile Main Line Valve spacing between the city of Escondido and the southern terminus of line 1600, which is shorter valve spacing than is required by Code for most locations in this section.
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.183	Vaults: Structural design requirements		Meet	
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.185	Vaults: Accessibility		Meet	
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.187	Vaults: Sealing, venting, and ventilation		Meet	
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.189	Vaults: Drainage and waterproofing		Meet	

SDG&E and SoCalGas Compliance with Applicable State and Federal Regulations					
Code	Section	Title	Requirement	Meet or Exceed	If exceeding, how?
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.195	Protection against accidental over pressuring	Each pipeline that is connected to a gas source so that the maximum allowable operating pressure could be exceeded as the result of pressure control failure or of some other type of failure, must have pressure relieving or pressure limiting devices that meet the requirements of §§192.199 and 192.201	Meet	
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.199	Requirements for design of pressure relief and limiting devices		Meet	
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.201	Required capacity of pressure relieving and limiting stations		Meet	
Subpart D - DESIGN OF PIPELINE COMPONENTS	§192.203	Instrument, control, and sampling pipe and components		Meet	
Subpart E – WELDING OF STEEL IN PIPELINES	§192.225	Welding procedures		Meet	

SDG&E and SoCalGas Compliance with Applicable State and Federal Regulations					
Code	Section	Title	Requirement	Meet or Exceed	If exceeding, how?
Subpart E – WELDING OF STEEL IN PIPELINES	§192.227	Qualification of welders	API 1104, "Welding of Pipelines and Related Facilities"	Exceed	SDG&E and SoCalGas require welders to perform an additional overhead weld for qualification that is not required by API 1104.
Subpart E – WELDING OF STEEL IN PIPELINES	§192.229	Limitations on welders		Meet	
Subpart E – WELDING OF STEEL IN PIPELINES	§192.231	Protection from weather		Meet	
Subpart E – WELDING OF STEEL IN PIPELINES	§192.235	Preparation for welding	API 1104, "Welding of Pipelines and Related Facilities" allows misalignment of 1/8"	Exceed	SDG&E and SoCalGas require more precise alignment by limiting misalignment to 3/32".
Subpart E – WELDING OF STEEL IN PIPELINES	§192.241	Inspection and test of welds		Meet	

SDG&E and SoCalGas Compliance with Applicable State and Federal Regulations					
Code	Section	Title	Requirement	Meet or Exceed	If exceeding, how?
Subpart E – WELDING OF STEEL IN PIPELINES	§192.243	Nondestructive testing	Code requires 10% and 15% of welds in Class 1 and 2 locations respectively, that are not in highway or railroad right-of-ways to be non-destructively tested.	Exceed	100% of welds in Class 1 and 2 locations not in highway or railroad rights-of-way will be non-destructively tested.
Subpart E – WELDING OF STEEL IN PIPELINES	§192.245	Repair or removal of defects	API 1104, “Welding of Pipelines and Related Facilities” allows repair of rejected first time repair	Exceed	SDG&E and SoCalGas do not allow subsequent repair of a rejected first-time repair.
Subpart G— GENERAL CONSTRUCTION REQUIREMENTS FOR TRANSMISSION LINES AND MAINS	§192.305	Inspection: General		Meet	
Subpart G— GENERAL CONSTRUCTION REQUIREMENTS FOR TRANSMISSION LINES AND MAINS	§192.307	Inspection of materials		Meet	
Subpart G— GENERAL CONSTRUCTION REQUIREMENTS FOR TRANSMISSION LINES AND MAINS	§192.309	Repair of steel pipe		Meet	

SDG&E and SoCalGas Compliance with Applicable State and Federal Regulations					
Code	Section	Title	Requirement	Meet or Exceed	If exceeding, how?
Subpart G— GENERAL CONSTRUCTION REQUIREMENTS FOR TRANSMISSION LINES AND MAINS	§192.313	Bends and elbows		Meet	
Subpart G— GENERAL CONSTRUCTION REQUIREMENTS FOR TRANSMISSION LINES AND MAINS	§192.317	Protection from hazards		Meet	
Subpart G— GENERAL CONSTRUCTION REQUIREMENTS FOR TRANSMISSION LINES AND MAINS					
Subpart G— GENERAL CONSTRUCTION REQUIREMENTS FOR TRANSMISSION LINES AND MAINS	§192.319	Installation of pipe in a ditch		Meet	
Subpart G— GENERAL CONSTRUCTION REQUIREMENTS FOR TRANSMISSION LINES AND MAINS	§192.323	Casing	Code does not require coating or cathodic protection of casing pipe.	Exceed	All casing pipe will be coated and cathodically protected regardless of outside agency requirements.
Subpart G— GENERAL CONSTRUCTION REQUIREMENTS FOR TRANSMISSION LINES AND MAINS	§192.325	Underground clearance		Meet	We typically exceed 12” clearance unless impracticable.
Subpart G— GENERAL CONSTRUCTION REQUIREMENTS FOR TRANSMISSION LINES AND MAINS	§192.327	Cover		Meet	

SDG&E and SoCalGas Compliance with Applicable State and Federal Regulations					
Code	Section	Title	Requirement	Meet or Exceed	If exceeding, how?
Subpart I— REQUIREMENTS FOR CORROSION CONTROL	§192.453	General		Meet	
Subpart I— REQUIREMENTS FOR CORROSION CONTROL FOR CORROSION CONTROL	§192.455	External corrosion control: Buried or submerged pipelines installed after July 31, 1971		Meet	
Subpart I— REQUIREMENTS FOR CORROSION CONTROL	§192.459	External corrosion control: Examination of buried pipeline when exposed		Meet	
Subpart I— REQUIREMENTS FOR CORROSION CONTROL	§192.461	External corrosion control: Protective coating		Meet	
Subpart I— REQUIREMENTS FOR CORROSION CONTROL	§192.463	External corrosion control: Cathodic protection		Meet	
Subpart I— REQUIREMENTS FOR CORROSION CONTROL	§192.465	External corrosion control: monitoring		Meet	
Subpart I— REQUIREMENTS FOR CORROSION CONTROL	§192.467	External corrosion control: Electrical isolation		Meet	
Subpart I— REQUIREMENTS FOR CORROSION CONTROL	§192.469	External corrosion control: Test stations		Meet	
Subpart I— REQUIREMENTS FOR CORROSION CONTROL	§192.471	External corrosion control: Test leads		Meet	
Subpart I— REQUIREMENTS FOR CORROSION CONTROL	§192.473	External corrosion control: Interference currents		Meet	

SDG&E and SoCalGas Compliance with Applicable State and Federal Regulations					
Code	Section	Title	Requirement	Meet or Exceed	If exceeding, how?
Subpart I—REQUIREMENTS FOR CORROSION CONTROL	§192.475	Internal corrosion control: General requirements		Meet	
Subpart I—REQUIREMENTS FOR CORROSION CONTROL	§192.476	Internal corrosion control: Design and construction of transmission line.		Meet	
Subpart I—REQUIREMENTS FOR CORROSION CONTROL	§192.479	Atmospheric corrosion control: General requirements		Meet	
Subpart J—TEST REQUIREMENTS	§192.503	General requirements		Meet	
Subpart J—TEST REQUIREMENTS	§192.505	Strength test requirements for steel pipeline to operate at a hoop stress of 30 percent or more of SMYS	Tests in Class 1 require a test to a pressure of 1.1 x Maximum Allowable Operating Pressure (MAOP); For Class 2 - 1.25 x MAOP; and Class 3 and 4 - 1.5x MAOP.	Exceed	Where possible the pipeline will be tested to 90% of its Yield Pressure (YP), including at least a 5% pressure spike. This will result in a test that is more than 2.5x MAOP, which exceeds the testing requirement for all locations.
Subpart J—TEST REQUIREMENTS	§192.515	Environmental protection and safety requirements		Meet	
Subpart J—TEST REQUIREMENTS	§192.517	Test Documentation		Meet	
Subpart L - OPERATIONS	§192.605	Procedural Manual for operations, maintenance, and emergencies		Meet	

SDG&E and SoCalGas Compliance with Applicable State and Federal Regulations					
Code	Section	Title	Requirement	Meet or Exceed	If exceeding, how?
Subpart L - OPERATIONS	§192.613	Continuing surveillance		Meet	
Subpart L - OPERATIONS	§192.614	Damage prevention program	Each operator of a buried pipeline must carry out, in accordance with this section, a written program to prevent damage to that pipeline from excavation activities.	Exceed	Additional pipeline cover is provided to aid in damage prevention. See 192.327 for "cover" details and 192.705 additional monitoring. Warning Mesh will be installed above the pipeline to identify the pipeline below. Fiber optic cabling with real-time monitoring for ground movement and inferential leak detection will be installed along the pipeline route.
Subpart L - OPERATIONS	§192.615	Emergency plans		Meet	
Subpart L - OPERATIONS	§192.616	Public awareness		Meet	

SDG&E and SoCalGas Compliance with Applicable State and Federal Regulations					
Code	Section	Title	Requirement	Meet or Exceed	If exceeding, how?
Subpart L - OPERATIONS	§192.619	Maximum allowable operating pressure (MAOP): Steel pipeline	The MAOP is the lowest of the following: 1. Design Pressure of the weakest component; or 2. Pressure obtained by dividing the test pressure by a factor based on Class Location.	Exceed	The pipeline will be operating at a lower pressure than the Code requires in Class 1, 2 and 3 locations due to designing the entire pipeline for a Class 4 location and testing to a higher pressure than required by Code (see sections 192.505 and 192.619).
Subpart L - OPERATIONS	§192.625	Odorization of gas	Odorizing is required for Class 3 and 4 locations.	Exceed	SDG&E and SoCalGas transmission pipelines are odorized regardless of location.
Subpart L - OPERATIONS	§192.629	Purging of pipelines		Meet	
Subpart M— MAINTENANCE	§192.705	Transmission lines: Patrolling	The requirement for the frequency of patrolling varies from 2 - 4 times per year depending on the location.	Exceed	Fiber-optic right-of-way continuous intrusion monitoring is planned to be installed on new pipeline sections where practical to provide early threat warning, consistent with the technology enhancements discussed in SDG&E and SoCalGas' PSEP.

SDG&E and SoCalGas Compliance with Applicable State and Federal Regulations					
Code	Section	Title	Requirement	Meet or Exceed	If exceeding, how?
Subpart M— MAINTENANCE	§192.706	Transmission lines: Leakage surveys	Leakage surveys must be conducted at intervals of 7.5 - 15 months depending on Class Location.	Exceed	Real-time above ground methane sensors will be installed on select sections of the pipeline identified by risk analysis consistent with the technology enhancements discussed in SDG&E and SoCalGas' PSEP for right-of-way leak monitoring. The fiber optic cable monitoring system referenced under 192.705 and 192.614 will also allow for pipeline leak detection in near-real time.
Subpart M— MAINTENANCE	§192.707	Line Markers		Exceed	In addition to the requirement to install above ground pipeline markers, SDG&E and SoCalGas will install Warning Mesh above the pipeline to indicate that there is a pipeline below the mesh.
Subpart M— MAINTENANCE	§192.731	Compressor stations: Inspection and testing of relief devices		N/A	

SDG&E and SoCalGas Compliance with Applicable State and Federal Regulations					
Code	Section	Title	Requirement	Meet or Exceed	If exceeding, how?
Subpart M— MAINTENANCE	§192.735	Compressor Station Storage of Combustible materials		N/A	
Subpart M— MAINTENANCE	§192.736	Compressor Station: Gas Detection		N/A	
Subpart M— MAINTENANCE	§192.743	Pressure Limiting and regulating stations; Capacity of relief devices		Meet	
Subpart M— MAINTENANCE	§192.751	Compressor stations: Prevention of accidental ignition		N/A	
Subpart N— QUALIFICATION OF PIPELINE PERSONNEL	§192.801	Scope		Meet	
Subpart N— QUALIFICATION OF PIPELINE PERSONNEL	§192.803	Definitions		Meet	
Subpart N— QUALIFICATION OF PIPELINE PERSONNEL	§192.805	Qualification program		Meet	
Subpart N— QUALIFICATION OF PIPELINE PERSONNEL	§192.807	Recordkeeping		Meet	
Subpart N— QUALIFICATION OF PIPELINE PERSONNEL	§192.809	General		Meet	

SDG&E and SoCalGas Compliance with Applicable State and Federal Regulations					
Code	Section	Title	Requirement	Meet or Exceed	If exceeding, how?
Subpart O—GAS TRANSMISSION PIPELINE INTEGRITY MANAGEMENT	§192.939	What are the required reassessment intervals	Operators are required to only perform a lesser confirmatory reassessment every 7 years if a longer reassessment period has been obtained.	Exceed	SDG&E and SoCalGas will be performing full integrity reassessments of the pipeline with internal inspection devices called smart pigs at a maximum interval of 7 years.

E. Construction Contractor Assessments and Recommendations



August 1, 2018
Attention: [REDACTED]
San Diego Gas and Electric

Subject: L-1600 Constructability Review

[REDACTED]

Pursuant to your request, [REDACTED] has performed a constructability review of the sixteen inch gas pipeline through an existing right-of-way (ROW). The current ROW occurs at various locations between Rainbow and Mission Stations.

Based on our site observations along the L-1600 easement and based on our review of the documents prepared by SDG&E through various emails, we offer the following comments and opinions.

- The existing route consists primarily of the following site conditions:
 - Two lane rural roads
 - Two and four lane city streets
 - Several golf courses
 - Commercial areas including parking lots
 - Earth ROW
- For all pipe installation activities occurring in two lane roads and city streets, [REDACTED] does not foresee any issues which could result in production inefficiencies beyond those typically observed (i.e. pedestrian and vehicle traffic). The installation process would be considered standard city street pipeline construction. In areas where traffic control is needed, [REDACTED] assumes sufficient working room for all construction activities. As a result,

[REDACTED]



reasonable productions and costs are to be expected.

- Outside the standard two lane roads and city street work areas, the remaining ROW will occur within a 20' wide easement. Consisting primarily of earth landscape, the 20' easement occurs through rolling hills, some brush covered, with trees (which will be removed and/or trimmed), and some deep canyons. Other segments of the ROW are situated between houses in residential areas where landscapes and hardscapes will be affected. Additionally, segments within the ROW are in commercial areas near buildings and in paved parking lots. The ROW also lays in a mobile home park and crosses several golf courses. While reviewing these differing site conditions, many problems/inefficiencies became apparent as described below.
 - In all likelihood, the existing 1949 sixteen inch pipeline is at an insufficient depth for large equipment to operate. Will require mats or additional cover for construction of a parallel pipeline. From our experience, there is an inherent risk associated with excavating next to and under the in service 69 year old, 16" gas line.
 - The 20' wide easement does not provide a sufficient work space area to install a 16" pipeline. Industry standard is 40 to 60 feet.
 - In our experience, installing a second pipeline in this type of ROW adds an additional 30-50% to installation costs.
 - Due to 20' wide ROW, all excavated material will need to be hauled off the work area in order to facilitate pipe stringing, bending, and laying.





- Increased risk of fire hazard while grinding/welding on current ROW.
- Environmental issues through the entire ROW, especially in the deep ravines during the wet seasons.
- Construction through deep ravines would be extremely difficult without additional work space.
- The 20' wide ROW and the limited access creates what is referred to as the "tunnel effect". The tunnel effect occurs when equipment, such as dump trucks, are required to enter and exit the ROW from the same point of access. For instance, during excavation activities, dump trucks will be required to enter the ROW in front of the excavation crew. Once the truck has been fully loaded with soils, it must exit the ROW from the same path it used to enter the section. Similar pathing is required for slurry and/or dump trucks during shade and backfill operations from one access point behind the backfill crew. All other activities are stuck in the middle.
- In some cases, due to site conditions or conflict with existing 16" pipeline, dump trucks are unable to park adjacent to the excavator while occupying the same ROW. As a result, the dump trucks will be required to park behind the excavator, requiring a one joint at a time type construction, which yields low production.
- While in the mobile home Park, difficulties arise due to the narrow streets and close proximity of homes adjacent to the ROW. With the existing 16" line, as well as other utilities in the narrow streets, low production installation should be





expected.

- The golf courses present the same limited access and narrow ROW problems as previously described. Installation will also interrupt play in addition to the difficulties/expenses associated with restoration of sod, sprinklers and electrical.
- In some residential areas the ROW runs between homes and/or accesses private property, in which case, landscape and/or hardscape will be affected. During the restoration process, issues may arise while trying to match or replace existing landscape/hardscape. There will, without doubt, be many disgruntled property owners if current route is selected.
- In the areas where the ROW traverses commercial parking lots, limited accessibility and reduced parking availability will be factors to consider during construction. Commercial parking lot paving is not typically constructed to support heavy trucks and equipment. Therefore, replacement could be extensive, well outside the limits of the trench and bell-holes.

In conclusion, it is our opinion that the new 16" pipeline should not be installed in the existing easement, except for areas which include paved roads & streets routes, as shown to [REDACTED] on the July 26, 2018.





Thank you for the opportunity to present this constructability review letter. If you have any questions, or require additional information, please do not hesitate to contact me at




Regards,





August 7, 2018

SUBJECT: Line 1600 Route Recommendation

 recently drove the Right of Way (ROW) for the proposed relocation of SDG&E's Line 1600 with representatives from the Public Utilities Commission (PUC) and SDG&E. We were asked to provide our opinion with regards to the feasibility of replacing the line within the existing ROW and potential alternatives. Below is a constructability comparison with regards both options.

Current ROW:

- The existing ROW is 20' wide and travels through steep and rocky mountainous terrain and close proximity to several residents (through yards and driveways).
- The ROW will need to be cleared and all work will need to be contained within the 20' area.
- There will be limited access to the ROW (one way in, one way out). This will limit production due to the accessibility of dump trucks and methods of excavation. It will also limit pipe and materials are brought to the ROW. Production will be held to 40-80 feet per day.
- The existing pipeline alignment will have constant heavy equipment traveling over it at any given time exposing it to risk for potential integrity issues.
- This pipeline was installed in the 1940's. Over time many oak trees have populated the area of the ROW. Our experience has been that we cannot dig within the "drip line" of the oak trees. This creates the need to find alternative installation methods such as boring to avoid environmental concerns.
- Following the installation in the ROW it has been our experience that hydro-seed is required per SWPPP measures. This also requires silt fence installation and water maintenance for several months beyond the project's completion.

Alternative Alignment:

- Installation in paved roads would greatly improve the installation environment for this project.
- Production rates would be as much as three to four times the rate than within the existing ROW
 - With the exception of Rice Canyon which would be approximately 60-80 feet per day production
 - Hwy 395 would be an additional route that would have higher production rates
 - There is plenty of access to the site due to the proximity of major highways
- There will be less direct impact to the public because we would be within the roadways and not near homes
- Environmental issues are limited (i.e. nesting birds and other inhabitants found in rural areas)
- The overall project duration would be greatly decreased

Our recommendation is that an alternative route be chosen. By installing this pipeline within the roadway we lessen the public and environmental impact along with the overall cost of the project. Please feel free to contact me if you have further questions.

Thank you,



ATTACHMENT 4

Petitioners Proposed revisions

ATTACHMENT 4

PETITIONERS' PROPOSED MODIFICATIONS TO D.18-06-028

1. Revise Finding of Fact 72 to read as follows:

72. SDG&E and SoCalGas should submit a Line 1600 hydrostatic test or replacement plan to the Safety and Enforcement Division within three months from the date of issuance of this decision and, upon Safety and Enforcement Division review, should submit the hydrostatic test or replacement plan to the Commission with supporting documentation including direct testimony and forecasted costs for consideration by the Commission in this proceeding.

2. Revise Conclusion of Law 19 to read as follows:

19. It is reasonable that no later than three months from the date of the issuance of this decision, consistent with General Order 112-F Reference, Title 49 Code of Federal Regulations, Part 192—Subpart J and National Transportation Safety Board recommendations, Section 958 of the Public Utilities Code and D.11-06-017, Applicants should submit to SED a hydrostatic test or replacement plan pertaining to the existing 49.7 miles of Line 1600 corridor. After review of the hydrostatic test or replacement plan by the Safety and Enforcement Division, SDG&E and SoCalGas should submit their hydrostatic test or replacement plan in this proceeding with supporting documentation including direct testimony and forecasted costs.

3. Revise Ordering Paragraph 7 to add the italicized compliance documentation identified in D.18-06-028 and to add a sentence at the end as follows::

7. No later than three months from the date of the issuance of this decision, consistent with General Order 112-F Reference, Title 49 Code of Federal Regulations, Part 192—Subpart J and the National Transportation Safety Board recommendations, Pub. Util. Code § 958 and Decision 11-06-017, San Diego Gas & Electric Company and Southern California Gas Company shall submit to Safety and Enforcement Division a hydrostatic test or replacement plan pertaining to the existing 49.7 miles of Line 1600 in its present corridor. *Applicants shall provide a detailed rationale that explains which segments of Line 1600 it proposes to hydrotest, and which segments it proposes to replace. Applicants shall also provide a detailed summary of existing physical commercial and residential structures that directly abut the edge of the easement (and any possible encroachments that lie within the easement) on Line 1600, including GPS coordinates. Based on this analysis, Applicants shall also identify proposed rerouting of the line in specific segments and/or removal or moving of specific physical structures, known at the time, due to safety compliance reasons.*

After review of the hydrostatic test or replacement plan by the Safety and Enforcement Division, SDG&E and SoCalGas shall submit their hydrostatic test or replacement plan in this proceeding with supporting documentation including direct testimony and forecasted costs.

4. Revise Ordering Paragraph 19 to read as follows:

19. This Application 15-09-013 remains open.